European RMBS Rating Criteria

Sector-Specific

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Scope

This report outlines Fitch Ratings' methodology for assigning new and monitoring existing credit ratings to obligations issued by securitisation transactions backed by residential mortgage loans in the following countries: Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain and Switzerland. Our *UK RMBS Rating Criteria* report is applicable to the UK.

The assumptions set out in these criteria are applicable to portfolios comprising mortgage loans with market-standard characteristics, as embedded in the data used to derive such assumptions.

The foreclosure frequency (FF) and recovery rate outputs of the asset model, ResiGlobal Model: Europe, are also applied to the analysis of covered bonds backed by residential mortgage loans in the above-listed countries. The house price decline (HPD) and foreclosed sale adjustment assumptions of these criteria are also applied to the analysis of SME balance-sheet securitisations backed by residential mortgage loans in the above-listed countries.

Key Rating Drivers

European RMBS ratings are driven primarily by an analysis of the issuer's assets relative to the liabilities. However, in certain transactions, the maximum rating may be constrained by the country of assets or operational risk considerations.

Country and Sector of Assets: Fitch applies country- and sector-specific assumptions that capture expectations for the performance of a representative pool of mortgage loans in different stress scenarios, taking into account historical mortgage loan performance and forward-looking macro-economic expectations. For the Netherlands, Fitch applies different assumptions to the owner-occupied and buy-to-let (BTL) sectors.

Key country- and sector-specific assumptions include the representative pool FF rate and HPD assumptions. The country of assets is an input to the asset analysis and it may also constrain the highest structured finance (SF) rating, as per Fitch's country risk criteria.

Asset Analysis: Fitch's asset analysis is expressed primarily in the transaction-specific FF and recovery rate assumptions that are implemented using a loan-level asset model, ResiGlobal Model: Europe. Fitch's country- and sector-level assumptions are tailored on a transaction-specific basis to differentiate the key loan and borrower attributes that are considered to be relevant to the FF and recovery rate. Fitch also takes into account originator-specific observations and reported default performance when setting transaction-specific assumptions.

Liability Analysis: Fitch's Multi-Asset Cash Flow Model is tailored to capture key structural features, such as the liability structure and priorities of payments for the transaction. The Multi-Asset Cash Flow Model tests the ability of cash flows generated from the assets to meet the defined payment obligations in different stress scenarios. In addition, Fitch applies secondary criteria assumptions within its Multi-Asset Cash Flow Model (e.g. interest rate, default distribution and prepayment scenarios).

Operational Risk: Origination practices and servicing capabilities can affect asset performance beyond the loan and borrower attributes. Fitch adjusts its FF assumptions for originator-specific factors. Fitch expects the appointed mortgage servicer to have capabilities consistent with market standards.

This report replaces *European RMBS Rating Criteria* dated 29 March 2023. This report also consolidates and replaces *Exposure Draft: Irish RMBS Foreclosure Frequency and Recovery Rate Assumptions Rating Criteria* dated 24 April 2023.

Related Criteria

See Appendix 3

Model

ResiGlobal Model: Europe

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Criteria Prerequisites

Criteria Application

These criteria are applicable to portfolios of residential mortgage loans in the following countries: Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain and Switzerland. These criteria assumptions are based upon an analysis of historical performance data of standard mortgages portfolios within the respective countries, as well as Fitch's expectations.

For the Netherlands, Fitch applies different assumptions to the owner-occupied and BTL sectors.

Prior to assigning a rating based upon these criteria, Fitch will make a determination regarding the applicability of these criteria to the given mortgage portfolio. In particular, Fitch will consider the product characteristics of the mortgage portfolio, the lending practices of the originator and the availability of originator-specific historical performance data.

In general, originator-specific historical performance data are expected to be provided for the longer of (a) five years and (b) a period covering all phases of at least one economic cycle. However, in the case of a portfolio with very standard product characteristics and a lender that demonstrates robust and consistent lending practices, Fitch's country- or sector-specific assumptions may facilitate the assignment of a rating where the provision of originator-specific data is less than the generally expected amount.

Representations and Warranties

Fitch expects the seller of the mortgage receivables to have an obligation and the ability to remedy any representations and warranties (R&Ws) breaches identified subsequent to the initial cut-off date. Where the R&W provider is not rated at investment grade, Fitch expects additional mitigants. Such additional mitigants may include extensive performance history of the specific asset portfolio, a strong R&W track record of the seller, a strong seller interest retention structure and the completion of additional data checks at the time of the sale of the portfolio.

Originator Review

These criteria are predicated on origination practises in line with market standards, while allowing for differences in borrower- and loan-specific attributes between originators and portfolios.

Fitch completes an originator review prior to the assignment of new ratings, including a loan file review. In the case of originators that issue repeat transactions, Fitch may substitute on-site reviews with update calls particularly for established originators with stable loan origination criteria and stable loan performance. The outcome of the originator review informs Fitch's determination of the criteria application, as well as the quantification of the originator adjustment. The originator review is focused on a number of key areas, including:

- loan sourcing (e.g. branch network versus intermediaries such as brokers);
- assessment of the borrower's creditworthiness;
- property appraisal procedures;
- technology platforms;
- staffing (levels, experience and incentives); and
- quality control framework.

For the loan file review, Fitch completes a targeted review of a sample of originator files to better understand the operational implementation and consistency of the originator's practices and policies. For repeat issuances, a loan file review may not be undertaken on a transaction-specific basis subject to (i) a third-party assessment report being received, in line with the section Data Review, and (ii) the latest loan file review being performed less than 24 months ago.

Servicer Review

The purpose of the initial servicer review is to form an opinion on the operational ability of the servicer to undertake its contractual administration and collection activities in accordance with the relevant market standards.

On an annual basis, Fitch requests servicers to complete a questionnaire. The purpose of the annual questionnaire is to identify whether the servicer has been subject to any material changes that may affect its ongoing ability to undertake administration and collection activities. Fitch may also request ad-hoc information from the servicer in relation to any transaction-specific, sector- or country-wide performance trends.

If the servicing entity is covered by an appropriate operational risk Servicer Rating, assigned by Fitch according to the criteria report *Criteria for Rating Loan Servicers* then Fitch will utilise information collected and the findings of such analysis when evaluating the ability of an entity to undertake servicing for a given transaction.

This may replace the need for the above initial and annual reviews. Where the servicer undertakes loan restructuring as part of the collection activity, Fitch will request information regarding the servicer's restructuring policy.

In addition to assessing the operational abilities of the servicer in place, Fitch also considers the extent to which the transaction documentation and structural features provide mitigants to ongoing servicing continuity risks. Such analysis is described in the *Structured Finance and Covered Bonds Counterparty Criteria*.

Data Requirements, Review and Adjustments

Historical Performance Data

For new transactions, the assignment of an initial rating is conditional on the receipt of the following data covering the mortgage portfolio of the originator:

- origination volumes;
- receivables balances;
- dynamic arrears levels;
- dynamic prepayment rate;
- cumulative default rates by vintage; and
- loan-level data on defaulted receivables, sale proceeds, recovery amounts and timing.

Where applicable, the above data should be split into different product lines. For transactions backed by seasoned portfolios (e.g. loans originated more than three years ago), Fitch may analyse the historical performance of the specific asset portfolio rather than the broader portfolio of the originator.

Loan-Level Data

The fields listed in *Appendix 1* are expected to be made available to Fitch for the initial and each subsequent cut-off date (as defined in the transaction documentation). The data fields required by Fitch are a subset of those defined in the ECB RMBS loan-level data template. References within this report to specific data fields are denoted by their ECB template field number (e.g. *AR67)*.

Fitch expects the fields listed in *Appendix 1* to be completed in accordance with the definitions contained in the RMBS template and taxonomy issued by the ECB. Fitch expects to be provided with data in all fields listed in *Appendix 1* (except for non-applicable country- or sector-specific fields) including those designated as "Optional" by the ECB.

Issuers may make loan-level data available via the European Datawarehouse (ED) or may provide data directly to Fitch. Where data are provided directly to Fitch, they are expected to cover the same fields and be prepared according to the same definitions.

Transaction Performance Data

For active transactions the following is expected for each collection period, as defined in the transactions documents:

- balance of performing receivables;
- balance of arrears receivables;
- balance of defaulted receivables;
- balance of newly defaulted receivables;
- balance of new receivables purchased;
- principal collections;
- interest collections;
- recovery collections; and
- information relating to any specific triggers, as defined in transaction documentation.

For active transactions, the following is expected for each interest payment date, as defined in the transaction documentation:

- note balances;
- cash account balances;
- swap payments/receipts; and
- distributions on interest and principal.

The above transaction performance data may be provided to Fitch using transaction-specific investor reports.

Data Review

When assigning new ratings, Fitch expects to receive a third-party assessment report that tests the accuracy of the transaction's loan-level data versus the originators systems and documents (e.g. agreed-upon procedure). Fitch will review the scope and findings of the report. Where no such report is provided at the time of assigning new ratings, Fitch will complete an extended file review (see *Originator Review*).

Fitch does not receive ongoing third-party reports or undertake ongoing file reviews in relation to existing ratings, unless material new receivables are added to the portfolio.

In its analysis of existing ratings, at least annually, Fitch reviews the loan-level data file. Fitch completes the following steps:

- review the completeness of fields listed in *Appendix 1;*
- compare the aggregate balances of key fields to the prior year loan-level file;
- compare the aggregate balance of key fields to the investor report; and
- review any other explanatory notes provided by the transaction parties.

For new and existing ratings, the findings of the above will be reviewed by the rating committee and a determination regarding the adequacy of the overall data provision (taking into account any applicable data adjustments) will be made.

Data Adjustments

If some of the required data fields are not available, the agency will consider the materiality of the missing data and the adequacy of the overall data provision. Fitch will not assign or maintain ratings where the overall data provision is deemed to be insufficient to arrive at a robust credit rating.

Where the overall data provision is deemed to be sufficient, but individual items of loan-level data are identified as missing or inconsistent with the ECB definitions, Fitch will consider the materiality of the data field to the overall rating assessment.

- Where the missing or inconsistent data is deemed to be immaterial, Fitch may proceed without making a specific data adjustment. Particularly in the case of a seasoned transaction with missing FF data fields, Fitch may determine that the missing data is already offset by the performance adjustment assumption described in these criteria. Alternatively, if this missing or inconsistent data is only relevant to a small portion of loans, its effect may be deemed to be immaterial to the overall rating.
- Where the missing or inconsistent data is deemed to be material, Fitch will apply assumptions or adjustments to address any missing or inconsistent data.

When reviewing the data template, Fitch will pay particular attention to fields containing a material portion of blank, "no data" or "other" entries and where a meaningful entry would be expected. Fitch may query such entries with data providers and may apply data adjustments as a result.

Data adjustments will be applied on a loan-level basis by amending the loan-level data file provided to Fitch or a portfolio basis as a portfolio-level manual adjustment. Data adjustments are intended to address missing or inconsistent data and will be derived taking into account alternative available information. The purpose of data adjustments is to obtain a model-implied rating (MIR) that is considered to be robust and reflective of the risks contained in the asset portfolio. Data adjustments are recorded and reviewed as part of the rating committee process.

Models

Summary

Fitch's RMBS asset analysis and cash flow analysis is conducted using ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model.

The models are input with loan-level portfolio data, transaction performance data, transaction specific structural features and Fitch's assumptions. ResiGlobal Model: Europe produces FF and recovery rate assumptions that are applied to the pool balance (of loans with a status of performing or arrears) within the Multi-Asset Cash Flow Model. In addition, ResiGlobal Model: Europe produces an assumed recovery rate that the Multi-Asset Cash Flow Model applies to the balance of loans, with a status of "defaulted" where the recovery process has not been deemed completed.

The Multi-Asset Cash Flow Model tests the ability of the assets to repay notes at each rating level and under 18 different assumption scenarios. The Multi-Asset Cash Flow Model produces a MIR for each class of notes.

Synthetic RMBS transactions may not require the use of the Multi-Asset Cash Flow Model as detailed in the *Synthetic Securitisations* appendix of the *Global Structured Finance Rating Criteria*. In such instances, the ratings may be determined by comparing the expected protection payments due at each rating level with the available enhancement or structural protection for each class of notes (including elements like synthetic excess spread, if applicable). Adjustments to WAFF and WARR may apply, depending on the transaction's definition of protection payment due (for example, accrued interest).

The loss we will refer to in transactions where protection payments correspond to 'ultimate' asset losses, will be calculated as WAFF x (1 – WARR Front). WARR Front is calculated, for each rating category, by weighting the portfolio WARR Vector by the front-loaded default distribution assumption shown in the foreclosure section of this report. The rating will be determined as the highest rating level in which the available protection is higher than the expected respective protection payment, subject to the *Rating Determination* paragraph.

In case the tenor of a synthetic transaction is shorter than that of its reference portfolio, Fitch may reduce the portfolio's 'lifetime loss expectation'. This reduction will be the result of the application of the default distributions mentioned in these criteria. For the avoidance of doubt, this applies whether the Multi-Asset Cash Flow Model is used or not. To capture tail risks in pro-rata structures, Fitch may test alternative evenly- and back-loaded default distributions so that

the same percentage of defaults is allocated as with the application of the front-loaded default distribution. Fitch will disclose the application of alternative default distributions in its transaction-specific commentary.

The application of the two models is described in the body of this report.

In addition, the European RMBS FF Model and the SF CVB RR Model are used to calculate macroeconomic adjustments as described in the dedicated sections below.

Unless otherwise indicated in the *Covered Bonds Rating Criteria*, Fitch's analysis of covered bonds backed by residential mortgage assets uses the FF and recovery rate outputs of ResiGlobal Model: Europe (and the corresponding assumptions) as described in this report. Cash flow analysis is completed using the Covered Bonds Cash Flow Model, which is described in the *Covered Bonds Rating Criteria*.

Sector Selection

For the Netherlands, ResiGlobal Model: Europe contains separate assumption sheets for the owner-occupied and BTL sectors. ResiGlobal Model: Europe applies sector assumptions depending upon the sector that is selected when populating the loan-level data template.

BTL loans identified using the occupancy type field (*AR130=3*), and for which lenders base their underwriting on property rental income (rather than borrower income) to assess borrower affordability, will be analysed using the BTL assumptions. Owner-occupied loans and BTL loans for which lenders base their underwriting on borrower income will be analysed using the owner-occupied assumptions, as long as the proportion of BTL loans is limited (e.g. less than 5% of the pool balance).

In the event a single transaction contains a mix of sectors each will be treated as a separate sub pool for the purpose of the asset analysis described in this report. The results of ResiGlobal Model: Europe will be combined within the Multi-Asset Cash Flow Model.

Loan Status

ResiGlobal Model: Europe applies a common definition of loan status and pool balance to all portfolios. Fitch applies its own definition of loan status to consistently apply its analysis. As shown in the table below, the loan status used in ResiGlobal Model: Europe is primarily determined by the corresponding entry to the account status *(AR166)* field of the ECB loan-level data template.

Mapping of Loan Status

Loan status	Loan-level template
Performing	Loans with AR166 = 1 or 2, and Arrears Balance (AR169) equal to or less than 0.1x the Payment Due (AR71)[a]; Excluding, certain restructured loans with AR122 = Y[b]. Excluding, loans deemed to have cross-defaulted, ie AR166 = 1 or 2 and same Borrower ID (AR7) has other loans with AR166 = 3.
Arrears	Loans with AR166=1 or 2, and Arrears Balance (AR169) greater than 0.1x the Payment Due (AR71)[a]; Excluding, loans deemed to have cross-defaulted, ie AR166 = 1 or 2 and same Borrower ID (AR7) has other loans with AR166 = 3. Plus, certain restructured loans with AR122 = Y[b].
Defaulted	Loans with AR166=3; Plus, loans deemed to have cross-defaulted, ie AR166 = 1 or 2 and same Borrower ID (AR7) has other loans with AR166 = 3.

[a] Payment due assumed to be EUR 500 if AR71 reported as zero or blank.
[b] See FF adjustments.
Source: Fitch Ratings

Loans with an account status *(AR166)* other than 1, 2 or 3 do not generate any proceeds within ResiGlobal Model: Europe and they may be removed from the loan-level data file along with any loans with a current balance *(AR67)* of zero. Where loans with an account status other than 1, 2 or 3 represent a material portion of the total current balance *(AR67)*, Fitch may investigate and manually reclassify the reported account status as part of the data review process.

ResiGlobal Model: Europe calculates the pool balance on a point-in-time basis as of the applicable cut-off date. The pool balance is calculated as the sum of the current balance *(AR67)* for loans that have a loan status of "performing" or "arrears" as per the above table.

As the result of (i) applying a loan status that may be different than that defined by the transaction documentation, and (ii) separating the balance of defaulted loans from the transaction's pool balance, ResiGlobal Model: Europe may produce summary statistics that are different than those reported in certain transaction-specific investor reports. These differences will be considered as part of the data review process.

Model Application

For RMBS ratings, ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model will be completed for a given transaction upon the initial assignment of ratings. The ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model will be updated on an annual basis (except in the circumstances listed below) to reflect changes in portfolio composition, liability structure, reported performance and Fitch's assumptions.

ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model may not be updated on an annual basis for transactions where all the following conditions are met:

- all rated notes are rated at the highest possible level (e.g. 'AAAsf' or non-model related rating cap);
- asset composition has been consistent with expectations since the last ResiGlobal Model: Europe analysis;
- asset performance and cash flow distributions have been consistent with expectations since the last Multi-Asset Cash Flow Model analysis;
- there have been no material changes to asset or cash flow assumptions since the last ResiGlobal Model: Europe and Multi-Asset Cash Flow Model analysis; and
- the annual rating committee determines that updated asset analysis and cash flow analysis is not relevant to the rating.

For transactions featuring revolving periods, ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model may not be updated on an annual basis during the revolving period where all the above conditions, except for the first condition, are met.

ResiGlobal Model: Europe may not be updated on an annual basis for transactions where all the following conditions are met (for the avoidance of doubt, the Multi-Asset Cash Flow Model will be updated in such instance):

- the applicable portfolio loss floor is higher than the unadjusted portfolio loss in the last ResiGlobal Model: Europe analysis at all rating scenarios, and it is highly unlikely that an updated ResiGlobal Model: Europe analysis would result in a higher unadjusted loss than the applicable portfolio loss floor;
- asset composition and asset performance have been consistent with expectations since the last ResiGlobal Model: Europe analysis;
- there have been no material changes to asset assumptions since the last ResiGlobal Model: Europe analysis; and
- the annual rating committee determines that updated asset analysis is not relevant to the rating.

Fitch will conduct more frequent model updates when it determines they are warranted by individual transaction circumstances. Such changes may include, but are not limited, to:

- the identification of a transaction-specific event or performance issue; or
- the identification of material changes in applicable ResiGlobal Model: Europe or Multi-Asset Cash Flow Model assumptions.

Rating Determination

RMBS ratings are determined by a rating committee. The MIR is a key input to the rating committee determination. Note ratings may differ from the MIR in the following situations:

- Note ratings are subject to a rating cap, as defined in the related criteria, and this rating cap is not factored into the MIR. In this case, the note rating will be the lower of the rating cap and the MIR.
- For new and existing ratings, a Fitch rating committee can consider other quantitative and qualitative factors when assigning the ratings. The final rating considered appropriate by the committee may be one notch above or below the relevant MIR.
- For existing ratings, where an updated analysis results in an MIR no more than three notches below the current note rating (e.g. MIR = 'BBB+sf' and current rating = 'Asf'), the current rating may be affirmed or downgraded at any level between the current rating and the MIR if it is expected that the MIR in future model updates will converge to the level of the current rating or to any rating level between the current rating and the MIR; for example, where the note exhibits a trend and expectation of increasing credit enhancement.

  For the avoidance of doubt, if the MIR in the updated analysis is more than three notches below the current note rating, the rating will be downgraded to the level of the MIR.[1]
- For existing ratings, where an updated analysis results in an MIR that is greater than the current rating, and Fitch expects that the MIR will be lower in the future model updates, the rating may not be upgraded to the level of the MIR; for example, where the structure exposes the transaction to a future reduction in MIR due to ongoing pro-rata amortisation with no expected switch to sequential. For the avoidance of doubt, the current rating may be upgraded at any level between the current rating and the MIR if it is expected that the MIR in future model updates will converge to that level[2].
- An MIR lower than 'B-sf' indicates that the note is not able to pay in full in all eighteen of the Multi-Asset Cash Flow Model scenarios tested at the 'B-sf' stress level. In such case, the rating committee will determine a rating in the range of 'Csf' to 'B-sf' by taking into account the expected case performance of the note and comparing this with Fitch's rating definitions. Ratings of 'B-sf' will only be determined where the rating committee expects the note to be paid in full and where there is an observable margin of safety (e.g. existing credit enhancement or and excess spread in excess of expected losses).

  The third bullet point above is not applicable when the MIR is lower than 'B-sf'.

Excess Spread Notes – Rating Cap

Excess spread notes are defined as capitalised notes issued in addition to the principal balance of the mortgage receivables and the balance of cash reserves as at the initial cut-off date and where the repayment of such notes is dependent upon the availability of excess spread. The MIRs of such notes are highly sensitive to cash flow modelling assumptions, especially prepayment rates. Ratings of such notes are capped at 'BB+sf'.

Revolving Periods

ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model address the modelling of the amortisation period of a transaction.

[1] For example: MIR = 'B+sf' and current rating = 'BBB-sf'. The rating will be downgraded to 'B+sf'. However, if MIR = 'BB-sf', the rating may be affirmed at 'BBB-sf' or downgraded at any level between 'BB+sf' and 'B+sf' if it is expected that the MIR in future model updates will converge to 'BBB-sf' or to any rating level between 'BBB-sf' and 'BB-sf'. In this second example, the assigned rating may be 'B+sf' despite an MIR of 'BB-sf' if other quantitative and qualitative factors are considered as per the second bullet point above.

[2] For example: MIR = 'AAsf' and current rating = 'A-sf'. The rating may be affirmed at 'A-sf' or upgraded at any level between 'Asf' and 'AA+sf' if it is expected that the MIR in future model updates will converge to 'A-sf' or to any rating level between 'A-sf' and 'AAsf'. The assigned rating may be 'AA+sf' despite an MIR of 'AAsf' if other quantitative and qualitative factors are considered as per the second bullet point above.

For transactions featuring revolving periods, or other material asset substitution options, the ResiGlobal Model: Europe inputs will be amended to reflect the potential portfolio as at the commencement of the amortisation period, taking into account the transaction-specific portfolio concentration limits.

Typical concentration limits are linked to:

- loan-to-value (LTV), weighted average (WA) original and current LTV ratios and distributions;
- debt-to-income (WA and distribution);
- loan type (e.g. payment frequency, WA and maximum maturity, loan purpose and product type);
- property characteristics (e.g. type, size, location and proportion of second homes);
- borrower concentration (top borrower, top 10 and top 20 borrowers); and
- geographic distribution of the borrowers.

In addition to adequate portfolio concentration limits, Fitch expects transactions with revolving periods to include effective mechanisms to stop the purchase of additional assets upon asset under performance.

Typical triggers are linked to:

- arrears levels;
- cumulative default levels;
- cash reserve levels; and
- principal deficiency ledger levels.

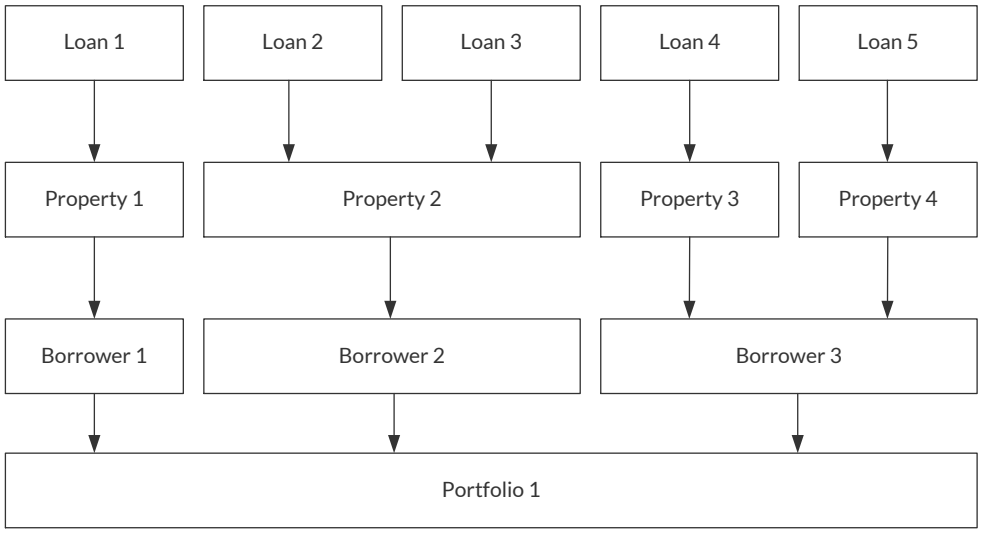
ResiGlobal Model: Europe – Loan Aggregation

The ECB data template requires each loan (or loan part) to be shown as a separate line item with a unique Loan Identifier *(AR3)* with a corresponding Property Identifier *(AR8)* and Borrower Identifier *(AR7)*.

Fitch's ResiGlobal Model: Europe performs calculations at loan, property and borrower levels as described in this report. Property-level calculations aggregate all loans within a portfolio that have the same Borrower Identifier *(AR7)* and Property Identifier *(AR8)*. Borrower-level calculations aggregate all loans within a portfolio that have the same Borrower Identifier *(AR7)*.

If the underlying lending arrangement consists of one loan secured by multiple properties, then Fitch expects data relating to the multiple properties to be aggregated into a single loan entry as per the ECB taxonomy.

Asset Model – Loan Aggregation Diagram



Source: Fitch Ratings

ResiGlobal Model: Europe does not take into account financial obligations of borrowers relating to loans not included in the portfolio, unless such obligations are secured upon the same property as the loans in the portfolio and rank in priority or on a pari passu basis. Loans that are secured on properties that are subject to prior balances *(AR80)* and/or pari passu loans *(AR82)* are expected to be reported in the loan-level data template and such balances are taken into account in ResiGlobal Model: Europe as described in this report.

Multiple Loans

For portfolios that contain multiple loans corresponding to a single property, the following aggregation assumptions are applied within ResiGlobal Model: Europe:

- The loan level inputs for Property Valuation Amount *(AR136)* and Current Valuation Amount *(AR143)* are summed to the property level. Fitch expects loan-level inputs to reflect pro rata loan-level amounts.
- The loan-level inputs for Prior Balances *(AR80)* and Pari Passu Loans (AR82) are summed to the property level. Fitch expects loan-level inputs to reflect pro rata loan-level amounts.
- The loan-level inputs for Mortgage Inscription *(AR94)* and Mortgage Mandate *(AR95)* are summed to the property level. Fitch expects loan-level inputs to reflect loan-level amounts.

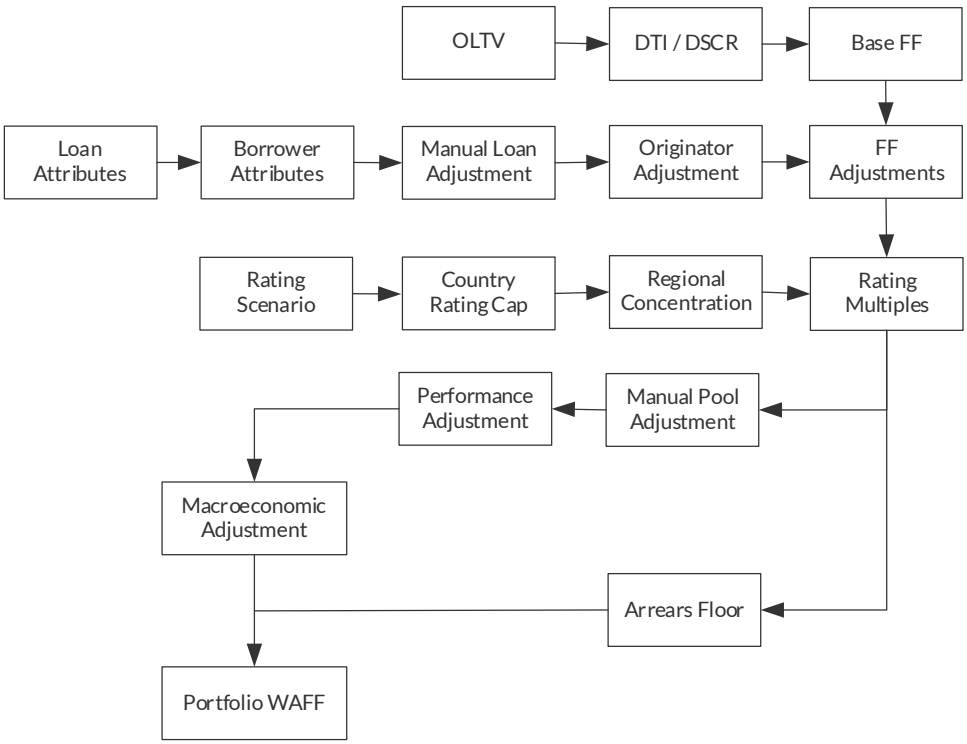
Property-level values may be pro rata to loan-level values on any basis, as long as the sum of the loan-level amounts – excluding loans with a Current Balance *(AR67)* of zero sum to the property-level amount.

ResiGlobal Model: Europe – Foreclosure Frequency

Fitch's ResiGlobal Model: Europe calculates loan-level FF assumptions for loans with a status of performing and arrears. ResiGlobal Model: Europe outputs a portfolio WAFF for each rating scenario, by notch.

The portfolio WAFF is calculated within ResiGlobal Model: Europe for each rating scenario by applying the steps summarised below.

Asset Model - Foreclosure Frequency Diagram



Source: Fitch Ratings

'Bsf' Representative Pool WAFF

For each country (and sector for the Netherlands), the 'Bsf' representative pool WAFF is the WAFF at the 'Bsf' level that results from the application of the base FF and FF adjustments to a representative pool of mortgage loans without arrears, without restructures and without the interest-only (IO) loan maturity adjustment.

The 'Bsf' representative pool WAFF for each country and sector has been derived from an analysis of country- or sector-specific historical data, benchmarking with comparable markets and countries, combined with forward-looking views and a limited margin of safety.

Country- and sector-specific representative pool 'Bsf' WAFF assumptions are shown in the country- or sector-specific sections of this criteria report. The representative pool 'Bsf' WAFF will be reviewed and may be amended in the event of significant and long-lasting changes in macro-economic or performance outlook for the given country or sector, while macroeconomic adjustments may be applied when unforeseen or temporary events or developments are expected to result in a more significant stress than what is included in the 'Bsf' representative pool WAFF.

Fitch has defined the country- or sector-specific representative pool compositions for the purpose of calibrating the criteria assumptions. The representative pools comprise loans with a mix of borrower and loan attributes that are intended to be broadly representative of the average portfolios which are addressed within the scope of the criteria.

Base FF

A loan-level base FF is derived from the country- or sector-specific FF matrix. The FF matrix captures the expected impact of (i) borrower-level OLTV and (ii) borrower-level debt-to-income (DTI) or debt-service coverage ratio (DSCR) within the loan-level FF assumption. The FF matrix for each country or sector is shown in the country- or sector-specific assumption sheet.

OLTV Calculation

OLTV is calculated at the borrower-level by dividing (i) the borrower's original loan balances, into (ii) the original value of the borrower's properties.

- The borrower's original loan balances are added together. For each loan the balance is taken (i) as the higher of the original balance *(AR66)* and the maximum loan balance *(AR87)*, plus (ii) the balance of any prior ranking balances *(AR80)*, plus (iii) the balance of any pari passu loans *(AR82)*.
- The original value of the borrower's properties is summed. For each loan, the value is taken as the valuation amount *(AR136)* adjusted by any criteria-defined valuation adjustment and by any transaction-specific valuation adjustment.
- In the prior calculation, the valuation amount *(AR136)* is substituted with the current valuation amount *(AR143)* for loans where the following conditions apply: (i) the current valuation date *(AR145)* is more recent or equal to that the valuation date *(AR138)*, and (ii) the current valuation type *(AR144)* is a full inspection *(i.e. 1 or 2)*.This is intended to take into account situations where a borrower has undertaken additional borrowing since loan origination and a full valuation has been undertaken.

DTI Calculation

DTI is used for all countries and sectors except Dutch and Irish BTL and is calculated at the borrower level by dividing the assumed monthly debt payment into the monthly income of each borrower within a portfolio.

- The assumed monthly debt payment for each borrower is calculated from the borrower's original loans balances, the WA original term to maturity and the WA interest rate. The monthly debt payment is calculated assuming a fully amortising constant periodic payment.
- The borrower's original loan balances are added together. For each loan, the balance is taken (i) as the higher of the original balance *(AR66)* and the maximum loan balance *(AR87)*, plus (ii) the balance of any prior ranking balances *(AR80)*, plus (iii) the balance of any pari passu loans *(AR82)*.
- The borrower's WA original term to maturity is calculated averaging the corresponding loan level original term to maturity periods weighted by the current balance. The loan-level original term to maturity is the difference between the loan origination date *(AR55)* and date of loan maturity *(AR56)*; it is capped at 360 months for bullet payment type loans *(AR72=6, 7, 8 or 9)*.
- Interest rate is calculated at the borrower-level by averaging the corresponding loan level assumed interest rates by current balance. The loan-level interest rate assumption is derived as follows, depending upon the interest rate type *(AR107)*:
    - For fixed-rate loans for life *(AR107=3)*, the assumed interest rate is equal to the current interest rate *(AR109)*;
    - For fixed-rate loans with resets *(AR107=4,5)* where the original fixed-rate period *(AR114 less AR55)* rounded to the nearest whole year is greater or equal to 10 years, the assumed interest rate is equal to the current interest rate *(AR109)*;
    - For fixed-rate loans with resets *(AR107=4,5)* where the original fixed-rate period *(AR114 less AR55)* is less than 10 years, the assumed interest rate is equal to the greater of (i) the current interest rate *(AR109)*, or (ii) the assumed country-or sector-specific reference rate plus country- or sector-specific assumed margin;
    - For floating-rate loans *(AR107=1,2,6,7,8,ND)* the assumed interest rate is equal to the greater of (i) the current interest rate *(AR109)*, or (ii) the assumed country-or sector-specific reference rate plus the greater of (a) the country- or sector-specific assumed margin, and (b) the highest reported loan-level margin *(AR110, AR113, AR115, AR117, AR120)*. The reference rates and assumed margin are specified in the relevant country- or sector-specific assumption sheet.

- Borrower income is taken as the sum of the primary income *(AR26)* and secondary income *(AR28)* and divided by 12. Where the borrower has multiple loans, the income data is taken from the loan with the latest loan origination date *(AR55)*. If all loans corresponding to the same borrower have the same loan origination date, then income data will be taken from the first loan listed in the data file. For borrowers with primary income and secondary income data equal to zero, ResiGlobal Model: Europe assumes a DTI of Class 5. This default setting may be amended on a transaction-specific basis (see Data Adjustment).

The DTI value is mapped to a class using the following table. The classes correspond to the columns shown in the country- or sector-specific base FF matrix.

DTI Classes

	Class 1	Class 2	Class 3	Class 4	Class 5
DTI ≥ than (%)	0	20	30	40	50
DTI < than (%)	20	30	40	50	

Source: Fitch Ratings

DSCR Calculation

For BTL loans in the Netherlands (as identified in our Sector Selection above) and Ireland (identified using the occupancy type field *(AR130=3)*), Fitch uses the DSCR to assess the ability of a borrower to cover assumed debt payments solely from the property rental income.

- DSCR is calculated at the borrower level as the ratio between the sum of the gross annual rental income from corresponding properties *(AR154)* divided by 12 and the assumed monthly debt payments. The assumed monthly debt payment calculation is the same as for the DTI calculation. For borrowers with gross annual rental data of zero, ResiGlobal Model: Europe assumes a DSCR of Class 5. This default setting may be amended on a transaction-specific basis (see *Data Adjustment*).
- For Ireland, if the same borrower within a portfolio has both BTL and non-BTL loans, both DTI and DSCR will be calculated for the respective loans. For the purpose of this calculation, the borrower's assumed monthly debt payment will be split between the BTL and non-BTL loans based on the current balance of such loans.

For Dutch BTL, the DSCR value is mapped to a class using the following table. The classes correspond to the columns shown in Dutch BTL base FF matrix.

Netherlands BTL DSCR Classes

	Class 1	Class 2	Class 3	Class 4	Class 5
DSCR < than (%)		160	120	100	80
DSCR ≥ than (%)	160	120	100	80	

Source: Fitch Ratings

For Irish BTL, the DSCR value is mapped to a class using the following table. The classes correspond to the columns shown in the Irish base FF matrix.

Ireland BTL DSCR Classes

	Class 1	Class 2	Class 3	Class 4	Class 5
DSCR < than (%)		120	110	100	95
DSCR ≥ than (%)	120	110	100	95	

Source: Fitch Ratings

FF Adjustments

Loan and Borrower Attributes

The base FF is adjusted to take into account certain loan or borrower attributes. The adjustments are applied to the base FF as combined multiples. The value of the adjustment for

each attribute is defined on a country- or sector-specific basis and the applicable values are shown in the country- or sector-specific assumption sheet.

FF adjustments apply to the following variables:

- Loan Purpose *(AR59);*
- Occupancy Type *(AR130);*
- Payment Frequency *(AR70);*
- Origination Channel *(AR58);*
- Interest Rate Type *(AR107);*
- Principal Payment Type *(AR72)*: For IO loans *(AR72=6)*, the magnitude of the adjustment depends on the borrower-level current loan-to-indexed property value ratio and the remaining term to maturity of the IO loan. The calculation takes into account all IO loan balances, any prior or pari passu loan balances and all property values relating to the borrower. The current balance (AR67) is floored at the Maximum Balance (AR87). For BTL loans *(i.e. AR130=3)*, loans that are both IO *(i.e. AR72=6)* and BTL receive a payment type adjustment of 1.0;
- Employment Status *(AR21)* and Income Verification *(AR27)*: In countries where Fitch applies a DSCR approach for BTL loans, borrowers of BTL loans are assumed to have an employment status of "*1*" to delink the FF assumption from the borrower's employment status;
- Foreign National *(AR16)*: as per the ECB template, loans with borrowers who are not nationals of the country of the loan and property are expected to be reported with an "*N*";
- Original Loan Term *(AR55*, *AR56)*;
- Adverse Credit *(AR38*, *AR35*, *AR36)*: for loans with multiple adverse credit entries, only the highest adjustment is applied*;*
- Type of Guarantee Provider *(AR74);*
- Restructuring Arrangement *(AR122*, *AR168*, *AR1)*: In countries or sectors where Fitch has calibrated a restructuring matrix, as shown in the country- or sector-specific assumption sheet, loans that are reported as having been subject to a restructuring arrangement *(AR122=Y)* will be subject to an adjustment. The adjustment will be in the form of a multiplicative increase to the FF or the reclassification of the loan status to arrears, depending upon time between the Date Last in Arrears *(AR168)* and the Pool Cut-off Date *(AR1)*, rounded to the nearest month. For Ireland, an alternative adjustment may be considered, see *Ireland: Restructured Loans FF*.

A value of "1.0" for a specific attribute within the assumption sheet denotes that Fitch has determined such attribute not to be significant to the FF performance of a loan (versus the Base FF). In such cases, no increase or decrease is applied to the FF.

A value of "-" for a specific attribute within the assumption sheet denotes that Fitch has not determined whether or not such attribute is significant to the FF performance of a loan (versus the Base FF). This is based on the limited observation of such attribute within historical data. In such cases, no increase or decrease is applied to the FF so long as the prevalence of such attributes remains negligible. If individual portfolios present notable levels of such attributes, then Fitch will consider the application of an alternative adjustment via the Criteria Variation process to address the presence of such attributes.

A limited number of the FF adjustments are applied from within a range of values. Such variable FF adjustments are specified in the *Key Country- and Sector-Specific Assumption* section of this report along with the methodology applied to determine applicable transaction-specific values. For such variable FF adjustments, the assumption sheet contains default values.

Manual Loan Adjustment

ResiGlobal Model: Europe includes the functionality to apply manual FF adjustments to individually identified loans of a user-defined magnitude. Such adjustments are applied only in

the event that individual loans are identified as having atypical characteristics, beyond those addressed in the applicable country- or sector-specific assumption sheet. The individual loans are identified in the loan-level data tape input to ResiGlobal Model: Europe while the magnitude of the adjustment is input to ResiGlobal Model: Europe. Such treatment will be treated as per the section Variations from Criteria.

In case the data review identifies the need for a data adjustment (see Data Adjustments section) for individual loans, then these will be applied by amending the loan-level data file prior to inputting it to ResiGlobal Model: Europe.

Originator Adjustment

Fitch's representative pool FF assumes the underwriting criteria and origination practices of a standard lender originating mortgages in a particular country or sector. An originator adjustment is applied on a portfolio-wide basis to reflect expected FF performance variations for a given portfolio (versus the market standard) that arise from lender origination factors that are not observable from the reported loan- or borrower-level attributes.

The originator adjustment is determined for a given portfolio at the time of the initial rating assignment, taking into account lender-specific historical performance data and Fitch's observations from the originator review.

The originator adjustment is generally kept constant throughout the life of a given transaction; as such factors are embedded in the mortgages at origination. However, Fitch may amend the magnitude of the originator adjustment where additional information received over time indicates the effect of the originator-specific factors may be higher or lower than previously assumed.

Different portfolios originated by the same lender attract the same originator adjustment except, for example, where the lender's origination practices changed materially over time and the portfolios were originated in different time periods.

Factors that contribute to an originator adjustment different from 1.0x (which is associated with standard lending practices for a given country or sector) are:

- Originator-specific historical performance data that materially vary from comparable market averages or comparable peer data – in which case the applicable originator adjustment will be based on observed performance variations;
- Originator-specific historical performance data that are limited in quantity – in which case the applicable originator adjustment will be derived, on a conservative basis, from an analysis of originator adjustments applied to comparable originators in the same country and sector; and
- Origination practices that vary from relevant market standards – in which case the originator adjustment will be applied, taking into account lender-specific data and a conservative analysis of originator adjustments applied to comparable lenders.

The originator adjustment reflects a general assessment of the portfolio. Loan- or borrower-specific attributes are addressed via loan-level adjustments.

Rating Multiples

For each country and sector, FF rating multiples are defined at each rating category relative to the 'Bsf' FF assumption. Higher multiples are applied to individual portfolios that exhibit regional concentration within a given country.

Standard Multiples

Standard FF rating multiples (i.e. without regional concentration) are defined at each rating category on a country- or sector-specific basis and the applicable values are shown in the assumption sheet.

Rating multiples are defined for standard prime portfolios for each country or sector, as shown in the assumption sheet. In addition, rating multiples for non-prime portfolios may be defined for individual countries or sectors and, if so, they are shown in the relevant assumption sheet. For France, rating multiples for certain specialised lenders' portfolios are defined and shown in

the French assumption sheet. For Ireland, rating multiples for portfolios with a high concentration of loans subject to forbearance and restructuring arrangements, and observed historical performance worse than market average, are defined and shown in the country-specific assumptions sheet for Ireland. ResiGlobal Model: Europe will apply the prime versus non-prime (or France: Specialised Lenders) multiple on the basis of the sector selection that is input to the model.

For pools that exhibit both prime and non-prime characteristics (and both sub-pools represent a material portion of the overall mortgage portfolio), Fitch will model the asset pools separately. For countries where the maximum rating is not constrained by country risk factors, the representative pool 'AAAsf' WAFF is equal to the product of the representative pool 'Bsf' WAFF and the 'AAAsf' rating multiple. Rating multiples were calibrated such that the representative pool 'AAAsf' WAFF for each country or sector contains a significant buffer relative to the long-term average historical performance. The representative pool 'AAAsf' WAFF is expected to remain constant through normal economic cycles.

Country Risk Rating Caps

For countries where the highest SF rating is constrained by country risk factors, the standard FF rating multiples in the country- or sector-specific assumption sheet incorporate the considerations set out in *Structured Finance and Covered Bonds Country Risk Rating Criteria*.

- In case the highest SF rating for a given country is at 'Asf' or above, the representative pool WAFF at the level of the highest SF rating is calibrated to be consistent with the representative pool WAFF that would have been applicable at the 'AAAsf' level in the absence of such a country rating constraint.
- In case the highest SF rating for a given country is at 'A-sf' or below, the representative pool WAFF at the level of the highest SF rating is calibrated to be consistent with the representative pool WAFF that would have been applicable two categories above the level of the highest SF rating level in the absence of such a country rating constraint. For the avoidance of doubt, this assumes that when the highest SF rating is at 'A-sf', the representative pool WAFF assumption at this level will be equal to the 'AA+sf' assumption plus one third of the difference between the 'AAAsf' assumption and the 'AAsf' assumption.

The highest SF rating level is shown in the applicable assumption sheet. A change in the sovereign IDR and/or the Country Ceiling may result in a change to the highest SF rating for a given country. A change to the highest SF rating will result in a recalibration of FF multiples as described above. Such recalibration will affect all rating levels above 'Bsf'; however, the change will be most pronounced at the level of the highest SF rating. Separately, a change in the sovereign IDR may affect Fitch's 'Bsf' representative pool WAFF if the sovereign IDR change is indicative of broader macro-economic changes.

The country- and sector-specific assumption sheet shows assumptions at a category level and ResiGlobal Model: Europe applies an interpolation to derive notch-level assumptions. Where the country is subject to a rating cap, the assumption sheets show values for rating levels higher than the highest SF rating, such values are for model calculation purposes only.

Regional Concentration

FF rating multiples for pools with regional concentration are defined at each rating category on a country- or sector-specific basis and the applicable values are shown in the assumption sheet.

A regional concentration is deemed to exist if the portion of properties within a given region based on property count exceeds the assumed population distribution of the same region *(e.g. Region 1 Population = 5.0%)* multiplied by a defined threshold *(e.g. 2.5x)*. For each country, the regions, assumed population and threshold are specified in the assumption sheet.

If a regional concentration is deemed to exist *(e.g. Region 1 Property Count = 25.0%)*, then the FF rating multiple applied to the portfolio will be derived as the WA of the standard multiples and the relevant regional concentration multiples (both specified in assumption sheets). The regional concentration multiple will have a weighting equal to the percentage of the portfolio property count that exceeds the respective regional population threshold *(e.g. 25.0% - 5.0% x 2.5 = 12.5%)*.

Manual Pool Adjustment

ResiGlobal Model: Europe includes the functionality to apply manual WAFF adjustments to a user-defined percentage of the performing portfolio of a user-defined magnitude. Such adjustments are applied only in the event that the data review identifies the need for a data adjustment (see Data Adjustments section) that cannot be applied to individual loans. Portfolio-level adjustments do not affect the WAFF for loans that are subject to the Arrears Floor.

For example, the data review process may determine that 5% of the performing portfolio should be assumed to have a particular loan attribute that would attract a loan-level FF adjustment of 1.40 according to the applicable assumption sheet; however, such loans cannot be identified within the loan-level data.

Performance Adjustment

The WAFF for loans with a status of performing may be subject to a further adjustment on a portfolio level to take into account the reported default performance of the specific transaction.

Fitch starts with a comparison of the projected default rate (as derived below) with the total portfolio expected-case WAFF (calculated without a performance adjustment and without macroeconomic adjustment). The purpose is to compare the criteria-derived transaction-specific WAFF with the observed performance, where the reported performance is considered to be indicative of future performance.

The projected default rate for a transaction is calculated by Fitch using information in the investor report and Fitch's assumptions. First, a dynamic default rate is derived for each historical collection period as the ratio of new defaults during each collection period (by loan balance, per the investor report) divided into the beginning of period portfolio balance (per investor report). The periodic dynamic default rates are then averaged over all collection periods (excluding the first 12 months from the closing date and any revolving period) and annualised. The annualised dynamic default rate is then converted to a static rate covering the portfolio's expected remaining term (rounded to the nearest year) by performing a simple amortisation calculation within ResiGlobal Model: Europe using country- or sector-specific assumptions on the prepayment rate, interest rate and the percentage of interest-only loans.

Subject to the caps and floors detailed below, a performance adjustment is calculated as the ratio of (i) the projected default rate, to (ii) the total portfolio expected case WAFF (without performance adjustment).

- The performance adjustment is capped at 100% when the cut-off date less the initial cut-off date is <1 year and capped at 200% if time since the cut-off date is ≥1 year.
- The performance adjustment is subject to a floor. The floor is 100% when time since the initial cut-off date is <3 years; 90% if ≥3 and <4 years; 80% if ≥4 and <5 years; and 70% if ≥5 years.
- The above floor may be further reduced to 60% in ≥6 and <7 years and 50% in ≥7 years, if the portfolio exhibits a WA loan to indexed value below 50% and the portfolio has withstood a significant economic stress.

Rating committees may deviate from the performance adjustment calculated by ResiGlobal Model: Europe (within the above caps and floors) based on qualitative considerations that will include the evolution of the portfolio composition, or changes in other performance drivers (notably the country macroeconomic environment) and their expected impact on future asset performance. As an example, the performance adjustment could be floored at 100% if the portfolio composition has materially migrated towards a riskier composition, all else being equal. Rating committees may also exclude some dynamic default rate observations corresponding to periods that are not considered informative of future performance anymore because of portfolio characteristics migration or because changes in the macroeconomic environment are expected.

Rating committees will also consider the influence of arrears movements in the portfolio composition on the performance adjustment calculated by ResiGlobal Model: Europe –all else being equal, an increase in arrears should not lead to improvement in performance adjustments, even if suggested by mere application of the above listed calculations.

Also, an increased floor (e.g. 100%) will be applied in situations including if: (i) investor reporting data is insufficient to reliably perform the above calculations; (ii) reported level of defaults is understated by repurchase activity of the originator or late default definition in transaction documents; or (iii) the portfolio has a significant back-loaded risk profile, such as a high percentage of high LTV interest-only loans.

The application of a Performance Adjustment different from the value calculated by ResiGlobal Model: Europe will be disclosed in its transaction-specific commentary.

The performance adjustment will be applied to the performing pool WAFF (without performance adjustment and before applying macroeconomic adjustments); it will not be applied to the arrears pool WAFF.

Macroeconomic Adjustments

When unforeseen or temporary events or developments are expected to result in a more significant stress than what is included in the representative pool WAFF, the WAFF for loans with a status of performing may be subject to macroeconomic adjustments. Such events or developments include, but are not limited to, catastrophic events, pandemics, significant changes to the regulatory or legal environment and any unexpected development that lead to a sudden and significant shift in projected performance.

Fitch will publicly disclose the application of (and any amendments to) macroeconomic adjustments, including the level of the adjustments, in dedicated research and in any transaction-specific commentary.

The macroeconomic adjustments will take the form of multiples determined at all rating levels at least equal to 1.0x, i.e. the adjustments can only result in an increase of the WAFF. They will be capped at 1.6x.

Fitch will first set 'Bsf' and 'AAAsf' macroeconomic adjustments, and then obtain the other category level adjustments (e.g. 'AAsf') as described below. ResiGlobal Model: Europe provides a notch-level portfolio WAFF for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs as explained below. For the avoidance of doubt, intermediate rating level adjustments will be determined even if no 'AAAsf' macroeconomic adjustment is applied (i.e. assuming a 1.0x adjustment at 'AAAsf').

'Bsf' Macroeconomic Adjustments

'Bsf' macroeconomic adjustments will be determined as the ratio of a stressed 'Bsf' representative pool WAFF and the 'Bsf' representative pool WAFF as defined above. The stressed 'Bsf' representative pool WAFF will be derived similarly to the 'Bsf' representative pool WAFF with a specific focus on the event or development being considered: it will be based on an analysis of sector-specific historical data combined with forward-looking views on the likely impact of the shock, plus a limited margin of safety.

'AAAsf' Macroeconomic Adjustments

'AAAsf' macroeconomic adjustments may be applied if the event or development creates a significant macroeconomic disruption so that the buffer embedded in the 'AAAsf' representative pool WAFF relative to the expected performance stress would no longer be sufficient. In that case, 'AAAsf' macroeconomic adjustments may be determined to ensure a sufficient level of remoteness in the 'AAAsf' assumptions.

Other Rating-Category Macroeconomic Adjustments

Fitch will first derive stressed 'Bsf' and 'AAAsf' representative pool WAFFs and then stressed 'AAAsf' rating multiples. Stressed rating multiples for the other rating categories will then be obtained with the aim of maintaining the progressivity of other criteria assumptions (e.g. rating multiples without macroeconomic adjustments) and taking into account the country risk rating caps considerations above. The other rating-category macroeconomic adjustments (e.g. 'AAsf') will be obtained as the ratio of the stressed representative pool WAFF to the representative pool WAFF (without macroeconomic adjustments) for each rating category.

The European RMBS FF Model is used to perform these calculations.

Arrears Floor

The FF assumption for loans with a status of arrears is subject to an additional floor intended to address the elevated FF risk of such loans.

The applicable loan-level FF floor is specified in the relevant country- or sector-specific assumption sheet and depends on the rating category and the extent of the Arrears Balance *(AR169)* relative to the Payment Due *(AR71)*. Where Payment Due is blank or zero, an amount of EUR500 is assumed for this calculation.

An arrears pool WAFF is calculated at each rating category by averaging the loan-level FF, after application of the floor, by the current balance *(AR67)* of loans with a status of arrears in each rating category.

Portfolio WAFF

The portfolio WAFF is calculated in the expected case and for each rating category level ('Bsf' to 'AAAsf') as the average of the performing pool WAFF and the arrears pool WAFF, weighted by the current balance (AR67). ResiGlobal Model: Europe provides a notch-level portfolio WAFF for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs. For example, 'AA+sf' WAFF is equal to 'AAsf' WAFF plus a third of the difference between 'AAsf' WAFF and 'AAAsf' WAFF. The notch-level WAFFs are input to the Multi-Asset Cash Flow Model and Covered Bonds Cash Flow Model for RMBS and covered bonds (CVB), respectively. The expected case output of ResiGlobal Model: Europe is used as the base case and 'CCCsf' input to the Multi-Asset Cash Flow Model.

IO Concentration WAFF

For portfolios with an IO maturity concentration, ResiGlobal Model: Europe also produces a supplementary portfolio WAFF at each rating level labelled as the IO concentration WAFF. The test is applied to the balance of loans with a status of 'performing' or 'arrears'. The purpose of this analysis is to identify periods of elevated balloon risk (e.g. periods of peak IO maturities) where the ratings would be particularly affected by high FF among IO loans, as the result of an economic downturn (and reduced refinance possibilities) coinciding with such periods. This test is applied in the Multi-Asset Cash Flow Model and the Covered Bonds Cash Flow Model for RMBS and CVB, respectively.

An IO maturity concentration is deemed to exist in portfolios where the maximum IO maturity concentration percentage exceeds 20%. The IO maturity concentration percentage is calculated for each year of the portfolio amortising as (i) the sum of the current balance *(AR67)* of IO loans *(AR72=6)* that have a status of "performing" or "arrears" and a maturity date *(AR56)* within the subsequent three consecutive calendar years, (ii) divided by the current balance of all loans that have a status of "performing" or "arrears" as of the cut-off date.

The IO concentration WAFF is derived at each rating category level by (i) applying the IO WAFFs from the following table to the maximum IO maturity concentration percentages, and (ii) applying the above derived 'Bsf' Portfolio WAFF to the remainder of the portfolio in all rating category scenarios. ResiGlobal Model: Europe performs a linear interpolation of the category-level IO WAFFs to produce notch-level IO WAFFs.

WAFF Applied to Maximum IO Maturity Percentage (IO WAFF)

Rating category	Netherlands BTL (%)	Other countries and sectors (%)
AAAsf	35	50
AAsf	25	35
Asf	20	25
BBBsf	10	15
BBsf	5	5

Note: For expected case and 'Bsf' scenarios, the standard portfolio WAFF assumptions are used.
Source: Fitch Ratings

The lower IO WAFF applied to Netherlands BTL reflects the lower probability of default at IO maturity compared to owner-occupied as the property sale is part of the BTL investment project.

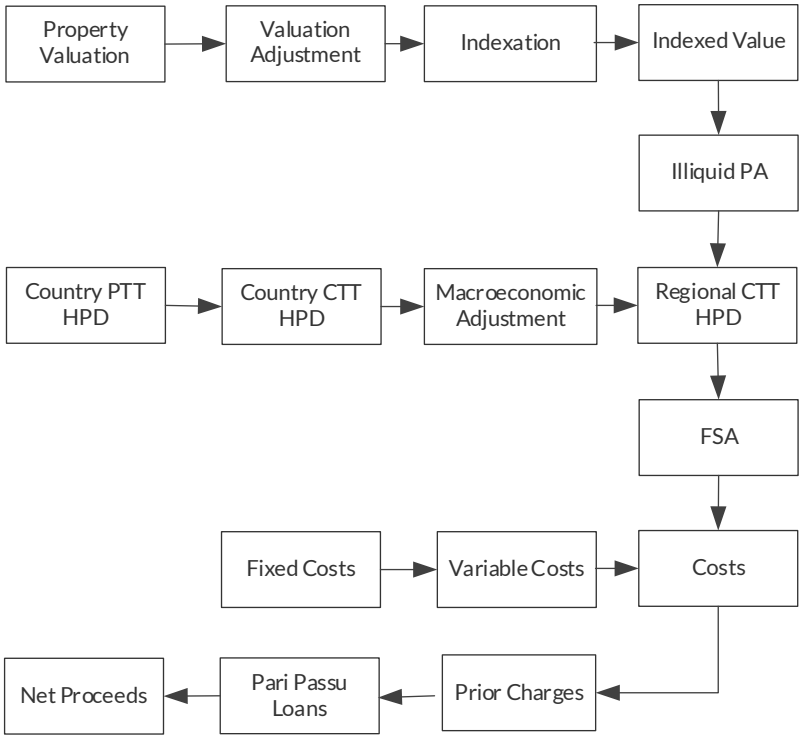
Where the IO concentration WAFF is higher than the standard portfolio WAFF at any rating level, a second Multi-Asset Cash Flow Model (the "stressed Multi-Asset Cash Flow Model") will be produced, using the IO concentration WAFF as inputs. If the stressed Multi-Asset Cash Flow Model produces MIRs that are more than three notches lower than the Multi-Asset Cash Flow Model with the standard portfolio WAFF, then the stressed Multi-Asset Cash Flow Model outputs will be the MIRs for the purpose of the rating analysis.

ResiGlobal Model: Europe – Net Proceeds

Fitch's ResiGlobal Model: Europe calculates assumed property-level net proceeds for all loans that have a status of performing or arrears as of the cut-off date. The net proceeds assumption represents the amount that would be recovered from the property in the event of a future default and foreclosure, net of foreclosure costs. The property-level net proceeds amount is used in ResiGlobal Model: Europe to calculate the borrower-level recovery rate.

The indexed value along with the HPD and foreclosed sale adjustment (FSA) assumptions are the key drivers of the property-level net-proceeds assumption. The property-level net proceeds amount is calculated within ResiGlobal Model: Europe for each rating category scenario by applying the sequence below.

Asset Model – Net Proceeds Diagram



Source: Fitch Ratings

Indexed Value

Property Valuation

For each loan, the property valuation will be taken either as the original Valuation Amount (AR136) or the Current Valuation Amount (AR143).

- The Current Valuation Amount will be used where the Current Valuation Type (AR144) is a full valuation (i.e. AR144 = '1' or '2'), and the Current Valuation Date (AR145) is later than

or equal to the original Valuation Date (AR138); otherwise, the original Valuation Amount (AR136) will be used.

- Where the Current Valuation Amount is used, the corresponding Current Valuation Date (AR145) will also be used; otherwise, the original Valuation Date (AR138) will be used.
- Where the Current Valuation Amount is used, the corresponding Current Valuation Type (AR144) will also be used; otherwise, the Original Valuation Type (AR137) will be used.

For loans corresponding to the same property, the relevant valuation amounts by loan will then be summed to arrive at the property value (assuming they were input on a pro rata basis). The applicable valuation date for the property will be based on the most recent applicable valuation date across the loan parts. The applicable valuation type, applicable property type and applicable region for the property will subsequently correspond to the loan part with the most recent applicable valuation date. If the applicable valuation dates are the same across all loan parts of a property, the information will be taken from the first loan listed in the data file that is linked to the property.

Depending upon the valuation type and the property country, Fitch will apply a valuation adjustment. The valuation amount will be multiplied by 100% minus the applicable valuation adjustment. As standard, an adjustment of 0.0% is applied in the case of full valuations. The country- or sector-specific valuation adjustments are specified in the relevant assumption sheet.

Loan-Level Manual Valuation Adjustment

Fitch may apply manual loan-specific valuation adjustments to properties in a given portfolio. The adjustments are applied to individual loans and the related properties if such loans are manually identified in the loan-level data file. The valuation amount will be multiplied by 100% plus any applicable loan-level valuation adjustment.

Loan-level manual adjustments performed for the purpose of applying a data adjustment will not be treated as variations from criteria.

Loan-level manual adjustments applied for other reasons will be treated as variations from criteria.

Indexation

Property values are indexed to capture the net effect of market price movements (upwards and downwards) between the applicable valuation date and the date of the most recent house price index observation within the model. Indexation is applied according to country-specific regional house price indices shown in the assumption sheet.

Individual properties are mapped to regions using first the Geographic Region List *(AR128)* provided in the data template. Where the Geographic Region List field is incomplete, the mapping uses the Property Postcode *(AR129)* field. If the postcode cannot be identified, the property will be mapped to the 'Other' category, as shown in the assumption sheet mapping tables.

ResiGlobal Model: Europe may apply a different house price index to properties purchased with government-subsidised loans. This functionality is provided primarily for Vivienda de Protección Official (VPO) properties in Spain. Within ResiGlobal Model: Europe, a loan is determined to be subsidised were the data field Subsidy *(AR64)* is completed with "Y" or where the data field Subsidy Received *(AR77)* is completed with a value greater than zero. The house price index applied to properties securing such subsidised loans is shown in the relevant assumption sheet. In countries where no distinction is made, the house price indices show the same values. Where multiple loans are backed by the same property, the subsidy status of the property is determined according to the entries corresponding to the first loan, although such entries are expected to be the same for all loans linked to a given property.

Illiquid Property Adjustment

Very high value property values are also subject to an illiquid property adjustment to reflect the expectation that such property values may suffer a higher degree of downward movement in a downturn relative to the market average.

The illiquid property adjustment factor is specified in the country- or sector-specific assumption sheet.

The illiquid property adjustment threshold amounts are calibrated such that approximately 2.5% of properties will exceed such thresholds. The applied illiquid property adjustment thresholds are specified in the relevant assumption sheet.

House Price Decline

The HPD assumptions vary by rating scenario and reflect the potential impact of differing degrees of economic stress upon house prices. The HPD assumptions are key inputs to Fitch's criteria; the 'Bsf' and 'AAAsf' peak-to-trough (PTT) assumptions are shown in the key country- and sector-specific assumption section of this report.

Fitch's HPD assumptions are applied on a current-to-trough (CTT) basis. HPD assumptions are specified for each country and vary by geographic region and the rating scenario category as detailed in the relevant assumption sheet. In this usage, "current" refers to the most recent observation contained in the applicable country-specific house price index (HPI), as shown in the assumption sheet.

In ResiGlobal Model: Europe, the applicable CTT HPD assumption is applied to the indexed property value (after application of the illiquid property adjustment factor) to capture the expected impact of different stress scenarios upon house prices.

Country PTT HPD

Country PTT HPD assumptions are calibrated taking into account an analysis of historical data and forward-looking expectations. In the first step Fitch defines country-specific PTT stresses. The 'Bsf' PTT HPD assumption captures Fitch's forward-looking views, as well as a limited margin of safety. The 'AAAsf' PTT HPD assumptions are calibrated such that they contain a significant buffer relative to historical performance and expectations. Macroeconomic adjustments may be applied when unforeseen or temporary events or developments are expected to result in a more significant stress than what is included in the country PTT HPD.

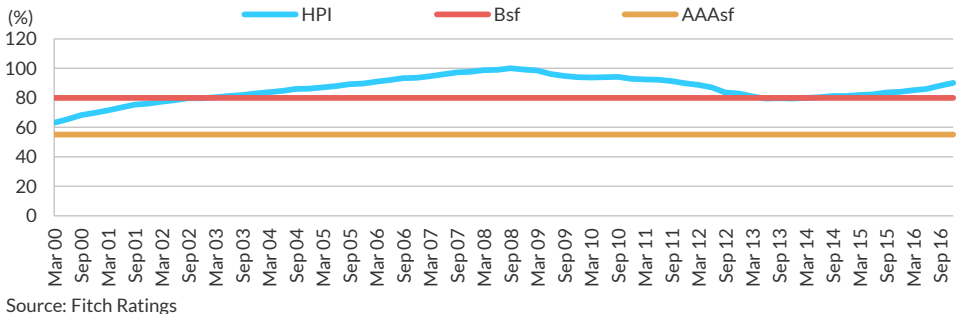
Country CTT HPD

National CTT HPD assumptions are calculated using the assumed national PTT HPD and the observed peak-to-current HPI movement as shown below.

In the example in the chart below, the HPI peaked in September 2008 at 100. The 'Bsf' PTT HPD is defined at 20% and the 'AAAsf' PTT HPD at 45%; therefore, it is assumed that the HPI falls to 80.0% in a 'Bsf' stress and 55.0% in a 'AAAsf' scenario.

House Price Decline Assumptions

Example



Source: Fitch Ratings

As at December 2016, the HPI was 90.0%; assuming that December 2016 represents the "current " value as defined above, the peak-to-current (PTC) decrease has been 10.0%.

The PTT assumptions are converted to CTT assumptions using the following equation:

$$CTT = 1 - (1 - PTT) / (1 - PTC)$$

Macroeconomic Adjustments

When unforeseen or temporary events or developments are expected to result in a more significant stress than what is included in the country PTT HPD assumptions, macroeconomic adjustments may be applied. Such events or developments include, but are not limited to, catastrophic events, pandemics, significant changes to the regulatory or legal environment and any unexpected development that lead to a sudden and significant shift in projected performance.

Fitch will publicly disclose the application of (and any amendments to) macroeconomic adjustments, including the level of the adjustments, in dedicated research and in any transaction-specific commentary.

The macroeconomic adjustments will take the form of percentage points representing increases to the country CTT HPD assumptions. They will be determined at all rating levels and will be floored at zero, i.e. the adjustment can only result in an increase of the CTT HPD assumptions.

Fitch will first set 'Bsf' and 'AAAsf' macroeconomic adjustments, and then obtain the other category level adjustments (e.g. 'AAsf') as described below. ResiGlobal Model: Europe provides a notch-level portfolio WARR vectors for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs as explained below. For the avoidance of doubt, intermediate rating level adjustments will be determined even if no 'AAAsf' macroeconomic adjustment is applied (i.e. assuming a zero adjustment at 'AAAsf').

Bsf Macroeconomic Adjustments

'Bsf' macroeconomic adjustments will be determined as the difference between a stressed 'Bsf' CTT HPD and the 'Bsf' CTT HPD as defined above. The stressed 'Bsf' CTT HPD will be derived similarly to the 'Bsf' CTT HPD with a specific focus on the event or development being considered.

First, a stressed country PTT HPD assumption will be assumed based on an analysis of country-specific historical data combined with forward-looking views of the impact of the event or development. The stressed country PTT HPD assumption is then converted into a stressed country CTT HPD assumption.

AAAsf Macroeconomic Adjustments

'AAAsf' macroeconomic adjustments may be applied if the event or development creates a significant macroeconomic disruption so that the buffer embedded in the 'AAAsf' CTT HPD relative to the expected stress on house prices would no longer be sufficient. In that case, 'AAAsf' macroeconomic adjustments may be determined to ensure a sufficient level of remoteness in the 'AAAsf' assumptions.

Other Rating-Category Macroeconomic Adjustments

Fitch will first derive stressed CTT HPD at 'Bsf' and at 'AAAsf' or at the highest SF rating if it is constrained by country risk factors, taking into account the Country Risk Rating Caps considerations above. The stressed CTT HPD at the other rating-category levels will be obtained by an interpolation aimed at maintaining the progressivity of other criteria assumptions (e.g. regional CTT HPD without macroeconomic adjustment). The other rating-category macroeconomic adjustments (e.g. 'AAsf') will be obtained as the difference between the stressed CTT HPD and the CTT HPD (without macroeconomic adjustment) for each rating category.

The macroeconomic adjustments at all rating categories will also be expressed as a factor representing the relative increase between the CTT HPD without macroeconomic adjustments and the stressed CTT HPD. This format will be used as input into ResiGlobal Model: Europe.

The SF CVB RR Model is used to perform these calculations.

Regional CTT HPD

Country CTT HPD assumptions are converted to regional CTT HPD assumptions by applying a regional scaling factor. The regional scaling factor ranges between plus 15% and minus 15% and is applied to the applicable country CTT HPD assumption. The regional scaling factor is intended to reflect the expectation that different regions may perform differently in a downturn.

HPD Update Process

On an annual basis, subject to the availability of updated house price indices, Fitch will update the house price indexation values, illiquid property thresholds and CTT HPD assumptions with ResiGlobal Model: Europe. More frequent updates will be performed if the house price indices indicate an increase or decrease of house prices by more than 10% compared with the last indexation.

Illiquid property threshold amounts will be updated to take into account the movement in the HPI.

The CTT HPD assumptions will be updated to reflect the latest PTC observation by applying the above calculations. If future house price index levels exceed the peak levels observed when setting the PTT HPD assumptions, the peak observed when setting the PTT HPD assumptions (the "Reference Peak") will continue to be referenced when calculating CTT HPD assumptions for the purpose of these annual updates. In addition, Fitch will review criteria assumptions on an annual basis; where property values have exceeded historical peaks, Fitch may redefine the Reference Peak and PTT HPD assumptions.

The country- or sector-specific assumption sheet will be updated to reflect any changes to the HPI values, CTT HPD and illiquid property threshold assumptions.

Country Risk Rating Caps

For countries where the highest SF rating is constrained by country risk factors, the PTT HPD assumptions incorporate the considerations set out in *Structured Finance and Covered Bonds Country Risk Rating Criteria*.

- If the highest SF rating for a given country is at 'Asf' or above, the PTT HPD assumption at the level of the highest SF rating is calibrated to be consistent with the PTT HPD assumption that would have been applicable at the 'AAAsf' level in the absence of such country rating constraint.
- If the highest SF rating for a given country is at 'A-sf' or below, the PTT HPD assumption at the level of the highest SF rating is calibrated to be consistent with the PTT HPD assumption that would have been applicable two categories above the level of the highest SF rating level in the absence of such country rating constraint. For the avoidance of doubt, this assumes that when the highest SF rating is at 'A-sf', the PTT HPD assumption at this level will be equal to the 'AA+sf' assumption plus one third of the difference between the 'AAAsf' assumption and the 'AAsf' assumption.

The highest SF rating level is shown in the applicable assumption sheet. A change in the sovereign IDR of a country, and/or the country ceiling, may result in a change to the highest SF rating for a given country. A change to the highest SF rating will result in a recalibration of PTT HPD assumptions as described above. Such recalibration will affect all rating levels above 'Bsf'; however, the change will be most pronounced at the level of the highest SF rating. Separately, a change in the sovereign IDR may affect Fitch's 'Bsf' PTT HPD assumption if the sovereign IDR change is indicative of broader macro-economic changes.

The assumption sheet shows CTT HPD assumptions at a category level and ResiGlobal Model: Europe applies an interpolation to derive notch level assumptions. Where the assumption sheets show values for rating levels higher than the highest SF rating, such values are for model calculation purposes only.

Foreclosed Sale Adjustment

In each rating scenario, the indexed value of each property (after application of any illiquid property adjustments and CTT HPD) are further subject to a country- or sector-specific FSA. The FSA is static in all rating scenarios. The FSA is intended to capture the expectation that foreclosed properties will report lower sale proceeds relative to the amount that would be expected based upon an indexation of the original valuation.

While the calibration of the FSA is informed by an analysis of country- and sector-specific historical data, historical data are often based upon a small and adversely selected sample; the assumption setting is therefore supplemented with qualitative considerations.

FSA assumptions are specified in the key country- and sector-specific assumption section of this report and the assumption sheets.

Costs

The property-level recovery proceeds are further reduced to take into account assumed foreclosure costs. The costs are applied on a fixed and variable basis. The fixed costs are applied on a per property basis. The variable costs are applied as a percentage of the indexed property value after reduction for any illiquid property adjustment, HPD and FSA.

The fixed and variable costs are defined on a country- or sector-specific basis and are specified in the assumption sheet.

Prior Charges

The property-level recovery proceeds are further reduced to take into account the balance of any prior charges using the data provided in Prior Balances (AR80) field for each property. The balance of the prior charge is increased to take into account assumed interest accrued during the foreclosure period using the WA interest rate of the corresponding borrower. If multiple loans with prior charges are backed by the same property, the prior charges balance will be summed across the loans.

Pari-Passu Loans

The property-level recovery proceeds are further reduced to take into account the balance of any pari-passu loans using the data provided in the Pari-Passu Loans *(AR82)* field for each property. The property-level recovery proceeds (after deduction of any prior charges) are reduced to take into account the share that is attributable to the pari-passu loan, using the sum of (i) the higher of the Current Balance (AR67) or Maximum Balance (AR87) for loans related to the property, and (ii) the sum of Pari-Passu Loans (AR82). If multiple loans with pari-passu claims are backed by the same property, the pari-passu balance will be summed across the loans.

Commercial Properties

Properties are deemed to be commercial properties within ResiGlobal Model: Europe where the Property Type (AR131) field is completed as commercial *(AR131 = 8 or 9)*. By definition, such instances are rare within RMBS portfolios.

In the case of a commercial property, the valuation will not be subject to the above-specified indexation, house price decline or foreclosed sale adjustment. Instead, the valuation will be subject to the commercial property market value decline assumption specified in the applicable assumption sheet.

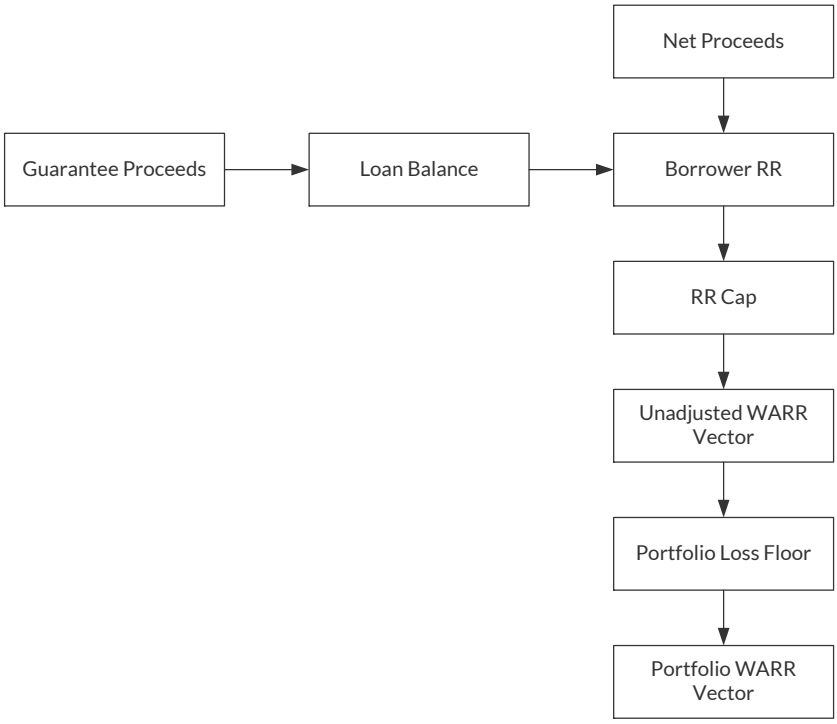
ResiGlobal Model: Europe – Recovery Rate

ResiGlobal Model: Europe uses the property-level net proceeds calculation to calculate borrower-level recovery rate and portfolio-level recovery rate assumptions. The portfolio-level recovery rate assumptions are input to the Multi-Asset Cash Flow Model and Covered Bonds Cash Flow Model for RMBS and CVB, respectively.

The borrower-level recovery rate essentially represents the property-level net proceeds amount plus any income from guarantees divided by the borrower's loan balances. Recovery rate assumptions are calculated for each year of the amortisation period (between year 1 and year 30 from the cut-off date). The purpose of the recovery rate vector is to take into account the difference in recovery rates, according to the time of the default, driven by expected amortisation of the loan balance and reduction in the guarantee coverage amount.

The borrower- and portfolio-level recovery rate is calculated within ResiGlobal Model: Europe for each rating category scenario by applying the sequence below.

Asset Model – Recovery Rates Diagram



Source: Fitrch Ratings

Borrower-Level Recovery Rate

ResiGlobal Model: Europe calculates borrower-level recovery rates for each year of the amortisation period (between year one and year 30 from the cut-off date) in each rating scenario category.

Borrower-level recovery rates are calculated for each year as the sum of expected recovery amounts divided by the assumed balance of loans. Recovery amounts for each borrower take into account the sum of linked property-level net proceeds as well as the sum of linked property level guarantee proceeds.

The borrower-level recovery rate is limited to an amount of 100% plus the assumed accrued interest following the default of the loan and prior to completion of the foreclosure (calculated by applying the foreclosure timing and a weighted average of the corresponding loan interest rate assumptions). The accrued interest is calculated using the assumed reference rate, assumed loan margin and applicable foreclosure timing specified in the relevant assumption sheet.

Where none of the loans linked to a property is covered by a guarantee, the property-level recovery amounts for the property will be equal to the property-level net proceeds described in the previous section.

Guaranteed Loan Proceeds

Guarantee proceeds for guaranteed loans are calculated as the sum of the following two components (these respectively capture the outcome where the guarantor makes a payment and where the guarantor does not make a payment):

- payment ratio x outstanding loan balance x guarantee amortisation factor, plus
- (1–payment ratio) x net proceeds from the property x mortgage conversion factor.

The result of the above is floored at the following amount:

- net proceeds from the property x mortgage conversion factor.

The payment ratio addresses the assumed likelihood of a payment from the guarantor. In the case of the Netherlands, the payment ratio assumption captures the assumed compliance ratio, the NHG loss sharing and any credit for originator repurchases or non-compliant NHG claims. In the case of France, the payment ratio addresses the assumed likelihood of payment from the guarantor.

The mortgage conversion factor addresses the likelihood of obtaining proceeds from the property where there is no initial mortgage security. The mortgage conversion factor is only applicable where the loan is not initially secured with a mortgage (e.g. France Caution loans); otherwise the mortgage conversion factor is set at 1.0.

Country- or sector-specific payment ratio and mortgage conversion factor assumptions are specified in the applicable assumption sheet.

For loans secured with NHG guaranteed loans *(AR74=7)*, ResiGlobal Model: Europe only treats the property (and all associated loans) as being covered by NHG if all loans relating to the property are covered by a NHG.

For other guarantee types *(AR74=9 or 10)*, where a property has multiple loans and some loans have a guarantee and some loans do not have a guarantee, the above guarantee proceeds calculation will be applied to the share of guaranteed loans and the net proceeds of the property will be applied to the non-guaranteed share.

The guarantee amortisation factor is only applicable to NHG guaranteed loans, identified where the Type of Guarantee Provider *(AR74)* is equal to "NHG Nationale Hypotheek Garantie" *(7)*. The guaranteed amount is assumed to be equal to the higher of the assumed original loan balance and maximum loan balance, amortising over the lower of (i) 30 years, and (ii) the calculated original term to maturity (rounded to the nearest whole year), since origination.

Loan Balance

The loan balance is calculated at the loan-, property- and borrower-level. The borrower-level loan balance is used as the denominator in the calculation of the borrower-level recovery rate. In year one of the ResiGlobal Model: Europe output, the loan-level loan balance is calculated as the higher of the Current Balance *(AR67)* and the Maximum Balance *(AR87)*.

Thereafter the loan-level loan balance is reduced on an annual basis over the calculated remaining term to maturity (rounded up to the nearest whole year) and assuming monthly amortisation. Amortisation is assumed for loans with a Payment Type (*AR72*) of "Annuity" *(1)*, "Increasing Instalments" *(3)*, "Fixed Instalments" *(4 or 5)*, "Bullet + Savings deposit" *(7)* on the basis of a constant amortisation profile. Amortisation is assumed for loans with a payment type of "Linear" *(2)* on a linear profile.

The amortisation calculation applies the same loan-level interest rate assumption described in the DTI Calculation section.

Recovery Rate Cap

The borrower-level recovery rate may exceed 100% of the corresponding loan balance (as at the date of default) in situations where the loan balances are increased post default via the application of accrued interest and where there are sufficient proceeds to cover such amounts.

On a country- or sector-specific basis, Fitch will apply additional borrower-level recovery rate caps. The cap may be set above 100% in countries or sectors with a demonstrated record of recovering accrued interest amounts. The borrower-level recovery rate caps are specific in the assumption sheets.

Unadjusted WARR Vector

Within ResiGlobal Model: Europe the unadjusted weighted average recovery rate (WARR) vector is produced by the aggregation of the borrower level recovery rates for each year of the amortisation period (between year 1 and year 30 from the cut-off date) and in each rating scenario category between 'Bsf' and 'AAAsf'.

Portfolio Loss Floor

ResiGlobal Model: Europe applies a portfolio loss floor to each portfolio. The portfolio loss floor is intended to ensure sufficient credit enhancement to mitigate against the risk of idiosyncratic recovery outcomes within a portfolio that would otherwise have a very low loss expectation. The portfolio loss floor may be reduced in the case of portfolios supported by guarantees (e.g. NHG scheme in the Netherlands). If the unadjusted portfolio loss rate is lower than the applicable country- or sector-specific floor as a result of the proceeds from the guarantee provider the applicable floor level will be reduced to a level below the unadjusted portfolio loss. For Dutch mixed portfolios (i.e. portfolios combining NHG-guaranteed loans and non-guaranteed loans), a weighted average floor will be computed based on the outstanding balance of NHG loans versus non-NHG loans, assuming a 0% floor for NHG loans and the applicable loss floor for non-NHG loans as described below (e.g. 4.0% at 'AAAsf').

The unadjusted loss is calculated for a portfolio at each rating category as:

- WAFF x (1 – WARR Middle)

WARR Middle is calculated, for each rating category, by weighting the Unadjusted WARR Vector by the middle-loaded default distribution assumption shown in the foreclosure section of this report.

Country- or sector-specific portfolio loss floors at the 'AAAsf' level are specified in the assumption sheets (e.g. 4.0%). Below 'AAAsf' the portfolio loss floor is calculated by applying the portfolio loss floor scaling factors shown in the assumption sheets to the 'AAAsf' loss floor:

The portfolio loss floor is implemented within ResiGlobal Model: Europe via the following calculations:

- The floored loss at each rating category-level (e.g. 'AAAsf') is equal to the higher of the unadjusted loss and the category portfolio loss floor scaling factor as outlined above.
- The floored loss at each rating notch-level (e.g. 'AA+sf') is calculated as the notch-specific WAFF x (1-notch-specific floored WARR).
- The floored WARR at each rating category-level is calculated as 1 less (category-specific floored loss / category-specific WAFF), and floored at 0%.
- The floored WARR at each rating notch-level is interpolated from the floored WARR at each rating category-level. Whereby, for example, 'AA+sf' is equal to a third of a category higher than 'AAsf'.

Country Rating Caps

In countries where ratings are subject to a country risk related rating cap lower than 'AAAsf' the portfolio loss floor will be applied based on theoretical 'AAAsf' assumptions specified in the applicable assumption sheet.

Portfolio WARR Vector

The portfolio WARR vector is calculated in the Expected Case and for each rating category level ('Bsf' to 'AAAsf') as per the steps described above. ResiGlobal Model: Europe provides a notch-level portfolio WARR vectors for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs. The Expected Case output of ResiGlobal Model: Europe is used as the Base Case and 'CCCsf' input to the Multi-Asset Cash Flow Model.

For RMBS the notch-level WARR vectors are input to the Multi-Asset Cash Flow Model. For CVB, a single set of notch-level WARRs is input to the Covered Bonds Cash Flow Model as specified in the *Covered Bonds Rating Criteria*.

ResiGlobal Model: Europe – Recoveries on Defaulted Receivables

ResiGlobal Model: Europe calculates a recovery rate in relation to loans that have a status of defaulted and where the recovery process has not been concluded.

Transaction eligibility criteria typically exclude defaulted loans from the asset pool as of the initial closing date. Therefore, this analytical approach is intended to be applicable to seasoned transactions that have accumulated a balance of defaulted loans since closing.

ResiGlobal Model: Europe outputs are used in the Multi-Asset Cash Flow Model for RMBS transactions. These ResiGlobal Model: Europe outputs are not used in the analysis of covered bonds due to the limited occurrence of defaulted assets within covered pools.

- The recovery process is deemed to be completed, at the property-level, if there is an entry in Date of Sale *(AR151)* or a non-zero entry Sale Price lower limit *(AR179)* for any individual loan corresponding to the property.

The remaining recovery amount is calculated for at the property-level as the difference between the expected recoveries and the recoveries collected to date.

- Expected recoveries are calculated applying the year one borrower-level recovery rate assumption (for the applicable rating stress scenario) and the recovery rate caps specified in the section "ResiGlobal Model: Europe – Recovery Rate" to the sum of values reported in the field Current Balance *(AR67)*.
- Recoveries collected to date are calculated as the sum of the Default or Foreclosure *(AR177)* field less the sum of the Current Balance *(AR67)* on loans linked to the same property, subject to a floor of zero.

The expected timing of remaining recovery amounts from properties is calculated with reference to the country- or sector-specific foreclosure timing assumptions for the relevant rating scenario less the time that has elapsed between the Date of Default of Foreclosure (AR178) and the Pool Cut-off Date (AR1). For properties where the applicable foreclosure timing period has already elapsed then no further recoveries are assumed.

The property-level recovery amounts are converted to a recovery rate (taking into account the balance of loans with a status of defaulted where the recovery process is not deemed closed) and timing vector that is input to the Multi-Asset Cash Flow Model.

Portfolio-level recoveries on defaulted assets are distributed over time (following the cut-off date) into five increments of equal duration. The timing of the final increment is equal to the applicable foreclosure timing assumption (e.g. 21 months). The timing of the first increment is equal to the timing of the final increment divided by five and rounded (e.g. four months). The timing of the second to fourth increment is equal to the timing of the prior increment plus the timing of the final increment divided by five and rounded. Within the ResiGlobal Model: Europe individual property proceeds are allocated to one of the buckets based upon the above property level timing calculation.

Multi-Asset Cash Flow Model

Overview

Fitch uses its proprietary Multi-Asset Cash Flow Model to determine the initial and ongoing ratings of RMBS notes.

Notes are tested according to the ability of the Issuer to meet the required interest and principal payments due under the notes, taking into account the stress assumptions applied to the asset analysis and the transaction structure. Note payments are tested on a timely or ultimate basis as detailed in the "Deferability of Notes" section of the *Global Structured Finance Rating Criteria*.

The Multi-Asset Cash Flow Model projects the transaction cash flows in multiple stress scenarios from the initial cut-off date (initial rating) or the latest cut-off date (existing rating) over the remaining term of the transaction. The Multi-Asset Cash Flow Model combines Fitch's stressed asset performance assumptions with the transaction-specific structural features to

produce a MIR for each class of notes. In most cases, Fitch's asset analysis assumptions are the most influential input to the Multi-Asset Cash Flow Model; however, structural features have an important effect on final rating levels.

When conducting cash flow analysis, Fitch's Multi-Asset Cash Flow Model first projects the portfolio scheduled amortisation proceeds and any voluntary prepayments for each reporting period of the transaction life assuming no defaults (and no voluntary terminations, when applicable). In each rating stress scenario, such scheduled amortisation proceeds and prepayments are then reduced by a scale factor equivalent to the overall percentage of loans that are not assumed to default (or to be voluntary terminated, when applicable). This adjustment avoids running out of performing collateral due to amortisation and voluntary prepayments and ensures all of the defaults projected to occur in each rating stress are realized in a manner consistent with Fitch's published default timing curve.

Model-Implied Rating

The MIR is defined as the highest rating level in which the respective class of notes is able to maintain note payments under all 18 cash flow scenarios. The multi-asset cash flow scenarios comprise all combinations of the following:

- increasing, stable and decreasing interest rates;
- front, even and back-loaded default distributions;
- high and low prepayments.

The Multi-Asset Cash Flow Model tests the ability of notes to repay in the expected case scenario (i.e. 'CCCsf'), as well as notch-specific rating scenarios from 'B-sf' to 'AAAsf'.

Amortisation Profile

ResiGlobal Model: Europe outputs a scheduled monthly amortisation profile for the portfolio in respect of the current balance of accounts with a status of "performing" and "arrears" as at the cut-off date.

Constant monthly amortisation is assumed in relation to loans that have a payment type *(AR72)* of Annuity *(1)*, Increasing instalments *(3)*, Fixed instalments *(4 and 5)* and Bullet + Savings deposit *(7)*. Linear amortisation is assumed for loans that have a payment type of Linear *(2)*. Other payment types are assumed to amortise at the Date of Loan Maturity *(AR56)*.

The amortisation calculation applies the same loan-level interest rate assumption described in the *DTI Calculation* section.

The amortisation schedule assumes zero defaults and zero prepayment. Prepayment and default assumptions are subsequently applied within the Multi-Asset Cash Flow Model.

The portfolio amortisation profile may be subject to an adjustment for payment holidays as described below.

Prepayments

The Multi-Asset Cash Flow Model applies prepayment assumptions according to the annual prepayment rate assumptions shown below. The model applies the assumption on a monthly compounded basis. The monthly rate is applied to the balance of performing receivables.

Annual Prepayment Rate

Rating scenario	High (%)	Low (%)
AAAsf	18.0	2.0
AA+sf	16.7	2.0
AAsf	16.0	2.0
AA-sf	15.3	2.0
A+sf	14.7	2.0
Asf	14.0	2.0
A-sf	13.3	2.0

Annual Prepayment Rate

Rating scenario	High (%)	Low (%)
BBB+sf	12.7	2.0
BBBsf	12.0	2.0
BBB-sf	12.0	2.0
BB+sf	12.0	2.0
BBsf	12.0	2.0
BB-sf	12.0	2.0
B+sf	12.0	2.0
Bsf	12.0	2.0
B-sf	12.0	2.0
CCCsf	12.0	2.0

Source: Fitch Ratings

Foreclosures

ResiGlobal Model: Europe provides a WAFF assumption for each rating scenario. In each rating scenario, the Multi-Asset Cash Flow Model applies the relevant WAFF to the pool balance. The resultant balance of defaulted receivables is then distributed over the remaining term of the transaction using the default distribution assumptions shown below. Three different default distribution scenarios are tested.

The months from the cut-off date in the default distribution assumptions refer specifically to the point during the amortisation period when the receivable becomes delinquent. However, to assess the effects of structural features triggered by an increasing volume of defaulted assets (e.g. Principal Deficiency Ledgers based on defaults, cumulative default triggers), the receivables will be defaulted in subsequent months according to the transaction default definition.

The values in the table below refer to the total amount of defaults during that time bucket; the values are divided by the number of months in the period to arrive at the monthly figure applied in the Multi-Asset Cash Flow Model.

Default Distribution

Month from cut-off date	Year from cut-off date	Front-loaded (%)	Middle-loaded (%)	Back-loaded (%)
1-12	1	20.0	20.0	2.5
13-24	2	20.0	10.0	2.5
25-36	3	15.0	10.0	5.0
37-48	4	15.0	7.5	5.0
49-60	5	15.0	7.5	5.0
61-72	6	10.0	7.5	5.0
73-84	7	5.0	7.5	10.0
85-96	8		5.0	10.0
97-108	9		5.0	10.0
109-120	10		5.0	10.0
121-132	11		5.0	10.0
133-144	12		5.0	10.0
145-156	13		5.0	5.0
157-168	14			5.0
169-180	15			5.0

Source: Fitch Ratings

For portfolios with fairly short remaining terms, these timings may be longer than the remaining term of the latest maturing loans so that not all defaults are allocated. In such cases, Fitch will amend the above default distributions as needed so that all defaults are allocated by proportionally front-loading the distributions.

Recoveries

The portfolio WARR vector is applied within the Multi-Asset Cash Flow Model to the value of receivables that in Fitch's scenarios will become defaulted loans, starting from the first month in arrears, to mirror the default distribution assumptions.

Foreclosure timing assumptions are used both in ResiGlobal Model: Europe and the Multi-Asset Cash Flow Model. The foreclosure timing assumptions, by rating category, are shown in the country- or sector-specific assumption sheet. These are input to the Multi-Asset Cash Flow Model by rating notch without interpolation.

Recoveries on Defaulted Assets

Where the asset portfolio contains defaulted loans, ResiGlobal Model: Europe outputs the current balance of such receivables and a recovery rate assumption vector for each rating scenario. These are input to the Multi-Asset Cash Flow Model.

Asset Yield

The purpose of asset yield analysis is to enable the Multi-Asset Cash Flow Model to capture and test the key interest rate dynamics of the transaction, also taking into account hedging arrangements and interest rate stress assumptions. Asset yield analysis is more significant for transactions with imperfect hedging arrangements.

The Multi-Asset Cash Flow Model is input with the percentage of the pool that has a fixed-rate asset yield and the percentage that has a floating-rate asset yield.

- For portfolios with floating-rate receivables, the assets may be further subdivided into up to eight buckets, whereby each of the eight groups has loans with a similar margin. The Multi-Asset Cash Flow Model is input with the average margin for each bucket. Where the margins are scheduled to change over time, the rates will be input on a periodic basis.
- For portfolios with fixed-rate receivables, the assets may be further subdivided into up to eight buckets, whereby each of the eight groups has loans with a similar fixed rate. The Multi-Asset Cash Flow Model is input with the average fixed rate for each bucket. Where the rates are scheduled to change over time, they can be input on a periodic basis.

Loan margins and rates will be input to the Multi-Asset Cash Flow Model on a bucketed basis where the portfolio contains wide dispersion in margins or rates. When rates are input on a bucketed basis, the Multi-Asset Cash Flow Model will apply a yield compression over time by the application of 100% of defaults and 80% of prepayments to the receivables within the higher-yielding buckets.

Portfolios may feature more complex asset yield arrangements versus those outlined above and complex hedges. In such cases, Fitch will tailor the modelling approach to reflect the transaction-specific features. Some examples are provided below:

- Basis risk will be modelled as per the Basis Risk section of the *Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria*.
- In the case of loans with initial fixed-rate periods and a contractual reversion to a floating rate, Fitch will include the combination of the fixed- and floating-rate yields over time.
- In the case of loans with an initial fixed rate and a future fixed-rate reset date, Fitch will assess the reset risk. For instance, for transactions exposed to decreasing interest rates, Fitch will test lower rates by applying a reduction to the loan rate that would otherwise be input to the Multi-Asset Cash Flow Model.
- Depending on the hedging mechanism, the interest reset risk may be covered by a swap, e.g. in cases where the swap guarantees a certain excess spread or where the swap rate changes in line with the asset rate. In such instances, Fitch may only model the interest collections after net swap payments in the Multi-Asset Cash Flow Model.

The analysis of asset yield is generally a secondary aspect in Fitch's analysis. Because asset yield analysis is largely transaction-specific, such analysis will not be deemed to be a Criteria Variation unless the analysis or assumptions applied vary from any statements in these criteria. Interest collections may be subject to an adjustment for payment holidays as described below.

Payment Holidays

In case of observed or expected material levels of payment holidays, Fitch may test in the Multi-Asset Cash Flow Model the resilience of the transaction's cash flow to a loss of interest collections and/or delays in principal receipts for the duration of payment holidays. The determination of such stress will be transaction-specific and will depend on projected take-up and length of schemes. It may affect interest collections, principal collections or both depending on the provisions under the schemes.

If interest collections are expected to be affected, Fitch may assume that a portion of interest collections will be lost for the modelled duration of payment holidays. Similarly, a proportion of principal collections may be assumed to be delayed and recovered gradually or at the end of the portfolio amortisation depending on the details of the schemes.

This stress should only lead to the same, or lower, ratings than a modelling without it. If this adjustment results in a higher MIR (e.g. because of a better use of excess spread over time), the MIR obtained in a modelling without this adjustment will be considered as the relevant MIR.

Fitch will disclose the application of a payment holidays stress in its transaction-specific commentary.

Note Balance

The Multi-Asset Cash Flow Model is input with the balance of the notes and any other liabilities issued by the Issuer. The note balance corresponding to the cut-off date used in the asset analysis is input to the Multi-Asset Cash Flow Model (i.e. the note balance that will result from the application of cash collections received up to the cut-off date).

Note balances will be obtained from the ECB bond template field Total Ending Balance Subsequent to Payment *(BR31)*; where this is not provided the investor report will be used.

The Multi-Asset Cash Flow Model will be input with the note coupon amounts as per the transaction documentation. Relevant margins will be obtained from the ECB bond template field Relevant Margin *(BR33)*; where this is not provided the investor report will be used.

Cash Reserves

Any cash reserve funds, such as a general reserve or a liquidity reserve, are input to the Multi-Asset Cash Flow Model as of the cut-off date. The cash balance corresponding to the cut-off date used in the asset analysis is input to the Multi-Asset Cash Flow Model (i.e. the cash balance that will result from the application of cash collections received up to the cut-off date).

Cash balances held by the issuer for the purpose of distribution on the next payment date are not input as cash balances; instead, the Multi-Asset Cash Flow Model inputs take into account the effect of distributing such funds.

Cash reserve balances will be obtained from the ECB bond template field Ending Reserve Account Balance *(BR3)*; where this is not provided the investor report will be used.

The Multi-Asset Cash Flow Model takes into account interest earned on the cash reserve account using a rate of the reference index used for the notes less 50bp per annum. The Multi-Asset Cash Flow Model projects future cash reserve balances in each rating scenario based upon the balance as of the priority of payments and target reserve amounts.

Hedging

The Multi-Asset Cash Flow Model will capture the impact of any interest rate hedging arrangements that are in place. The modelling of interest rate swaps includes the notional balance and the rate payable under each leg of the swap.

Under certain swap structures, modelling of the asset yield and the swap payments may be simplified as long as the Multi-Asset Cash Flow Model reflects the net economic position.

Swap termination payments are not taken into account in the Multi-Asset Cash Flow Model as long as the hedging arrangements are consistent with the expectations set out in Fitch's Structured Finance and Covered Bonds Counterparty Rating Criteria. Cross-currency swaps are typically structured to match individual issued notes, whereby payments due to the noteholder are indirectly paid by the counterparty in the currency of the notes. Therefore, the Multi-Asset Cash Flow Model does not include cross-currency swaps; rather, the Multi-Asset Cash Flow Model tests the ability of the Issuer to meet interest and principal payments due to the counterparty in the currency of the assets.

Priority of Payments

The Multi-Asset Cash Flow Model will include the key components of the transaction's pre-enforcement priority of payments obtained from transaction documentation.

The Multi-Asset Cash Flow Model will include the key components of available interest and available principal funds. The priority of payments will be combined or separate as per the transaction documents. The relative sequence of key items will be reflected in the Multi-Asset Cash Flow Model. The Multi-Asset Cash Flow Model differentiates between sequential and pro-rata amortisation.

Servicing Costs

Annual servicing costs assumptions are shown below; they are applied to the end of period balance of performing, arrears and defaulted loans. Where transaction documentation specifies a higher rate, Fitch will use the documented rate.

Servicing Costs

Rating scenario	Netherlands (%)	Other countries (%)
AAAsf	0.30	0.45
AA+sf	0.28	0.42
AAsf	0.27	0.40
AA-sf	0.26	0.38
A+sf	0.24	0.37
Asf	0.23	0.35
A-sf	0.22	0.33
BBB+sf	0.21	0.32
BBBsf	0.20	0.30
BBB-sf	0.20	0.30
BB+sf	0.20	0.30
BBsf	0.20	0.30
BB-sf	0.20	0.30
B+sf	0.20	0.30
Bsf	0.20	0.30
B-sf	0.20	0.30
CCCsf	0.20	0.30

Note: The lower rates for the Netherlands reflect the presence of a developed third-party servicing market.
Source: Fitch Ratings

Interest Rates

The Multi-Asset Cash Flow Model is populated with Fitch's interest rate stress assumptions as per Fitch's *Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria*. In case a transaction features an interest rate cap, either on the note coupon or a cap agreement with an external counterparty, upward interest rate stress assumptions exceeding the cap level may be unduly beneficial for the transaction's cash flow projection. In such an event, Fitch will apply a reduced upward interest rate stress.

Key Country- and Sector-Specific Assumptions

Key country- and sector-level assumptions are shown below. These assumptions are key inputs to the calibration of the detailed country- or sector-specific assumptions and reflect Fitch's overall assessment of the standard mortgage portfolios within the respective countries. For the Netherlands, Fitch applies different assumptions to the owner-occupied and BTL sectors.

As described in this criteria report, Fitch tailors its asset assumptions to reflect the loan level attributes of each mortgage portfolio. The full set of country- or sector-specific assumptions applied in ResiGlobal Model: Europe is shown in the relevant assumption sheets that can be extracted from ResiGlobal Model: Europe. This includes the highest SF rating level applicable for each country.

In addition, where country- or sector-specific analysis is supplemented with further assumptions, these are set out below.

Belgium

Key Assumptions: Belgium

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	2.0
FF multiple – Highest SF rating level (x)	6.0
Representative pool WAFF – Highest SF rating level (%)	12.0

Recovery rate	
Reference peak	Sep 20
Peak-to-trough assumption – 'Bsf' (%)	5.0
Peak-to-trough assumption – Highest SF rating level (%)	40.0
Foreclosed sale adjustment (%)	25.0

Source: Fitch Ratings

Belgium: Inscriptions and Mandates

In Belgium, the value of the registered mortgage (i.e. inscription) may be less than the original balance of the mortgage. Such an arrangement is usually supplemented with a mortgage mandate, whereby the lender is able to unilaterally create an additional lien over the property at a future date. Registering the mortgage at a value lower than the original loan balance reduces administration costs; however, the ranking of the converted mandate security may be subordinated to additional liens (if registered against the property in the interim).

The sum of the registered mortgage plus the mortgage mandate amount are typically at least equal to the original balance of the loan. Also, mortgage inscriptions typically represent the majority of the security amount and loans only secured by a mandate are very limited. Fitch may adjust its analysis for portfolios with a high proportion of loans backed only by mandates (e.g. more than 10%) or when the proportion of mortgage inscriptions is low (e.g. when 60% or more of the portfolio are loans where the outstanding loan balance is more than 150% the mortgage inscription amount) – in both cases as compared with market standards.

To perform this assessment, Fitch expects to receive the proportion of loans backed only by mandates and the portfolio stratification of the ratio of outstanding loan balance divided by mortgage inscription. This assessment will be applied at least once (typically for new ratings) and may not be repeated for future rating reviews, as the inscription coverage typically increases with loan amortisation. However, for revolving portfolios, cover pools or when Fitch believes the coverage might have evolved materially, Fitch may require updated information and perform this assessment.

France

Key Assumptions: France

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	4.2
FF multiple – Highest SF rating level (x)	4.2
Representative pool WAFF – Highest SF rating level (%)	17.6

Recovery rate	
Reference peak	Jun 20
Peak-to-trough assumption – 'Bsf' (%)	14.8
Peak-to-trough assumption – Highest SF rating level (%)	43.2
Foreclosed sale adjustment (%)	25.0

Source: Fitch Ratings

France: Guaranteed, Mortgage and Alternative Security Loans

The representative pool WAFF for France is based on a combination of guaranteed and mortgage loans. The different loan types exhibit different FF rates and the extent of the performance variation is driven by originator-specific factors. To reflect the effect of the loan type in the loan-level FF assumption, Fitch applies the following adjustments:

- Guaranteed loans are subject to an FF adjustment in the range of 0.4x to 1.0x.
- Mortgage loans are subject to an FF adjustment in the range of 1.0x to 2.0x.

Some French pools could contain alternative security loans, which are subject to an FF adjustment in the range of 0.7x to 1.2x.

The magnitude of the loan type adjustments will be determined on a transaction-specific basis at the time of the initial rating assignment by comparing originator-specific historical performance data for each loan type against a weighted average that reflects the composition of the representative pool. When subsequent originator-specific data suggest material performance deviations since transaction closing, the magnitude of the loan type adjustments may be changed at the time of the annual rating surveillance.

France: Recovery Rate Guaranteed Loans

Guaranteed Loans are identified where the loan-level field Type of Guarantee Provider *(AR74)* is equal to Caution (9) or Other (10).

The guarantee provider is identified using the loan-level field Guarantee Provider *(AR75)*.

Fitch will apply the payment ratio assumptions depending upon the combination of type of guarantee and the provider; these are shown in the country-specific assumption sheet for France.

- The "Caution: Eligible Guarantor" column refers to payment ratio assumptions applied to Crédit Logement and to other guarantee providers considered eligible by Fitch (see below).
- The "Caution: Non-Eligible Guarantor" column refers to payment ratio assumptions applied to other guarantee providers considered non-eligible by Fitch.
- The "Other" column relates to payment ratio assumptions that are applied in the case of alternative security. These are identified in the loan-level field Type of Guarantee Provider (AR74=10); this payment ratio assumption is subject to an originator-specific assessment.

Fitch will consider a guarantee provider as an eligible guarantor if the following conditions are met:

- The guarantee provider is a Fitch-rated entity or is a majority-owned subsidiary and core activity of a Fitch-rated entity that has an IDR in the 'A' category. If the rating is in a different rating category, Fitch may apply different payment ratio assumptions via the Criteria Variation process;

- The guarantee provider demonstrates a robust and consistent underwriting and servicing process;
- The guarantee provides full protection over the outstanding balance of the loan and any accrued interest;
- The benefits of the guarantee are transferred to the issuer; and
- Ineligible claims (i.e. claims for which the guarantee provider declines payment due to non-compliance) are limited (e.g. below 5% on average over several years).

For guarantors that belong to the same banking group as a loan originator – an internal guarantor – the following additional conditions should be met:

- The guarantee provider has the means to evaluate independently the risk associated with the guarantee at inception and through the life of the loan;
- The guarantee provider constitutes provisions dedicated to hedge the risk related to home loans guarantees; and
- Such provisions are ring-fenced in case of the bankruptcy of the banking group.

Fitch applies mortgage conversion factor assumptions; these are shown in the country-specific assumption sheet for France. The purpose of the mortgage conversion factor is to address the situation where the guarantor does not pay, but the Issuer is able to obtain recovery proceeds from the property.

Where multiple loans backed by a single property are secured by different guarantees, an average of the resulting loan-level payment ratio and mortgage conversion factor by current balance of the guaranteed loans will be computed.

The above assumptions are applied to the calculations described in the recovery rate section of this report.

France: Specialised Lenders

For typical portfolios of specialised lenders with concentration on risky characteristics such as high OLTV, and observed historical performance data materially worse than market average, Fitch typically captures the higher FF expected for these collateral portfolios with its originator adjustment. As a result of applying significantly higher 'Bsf' FF assumptions to typical specialised lender portfolios, Fitch applies compressed stress multiples as per the country-specific assumption sheet.

Germany

Key Assumptions

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	2.2
FF multiple – Highest SF rating level (x)	6.8
Representative pool WAFF – Highest SF rating level (%)	15.0

Recovery rate	
Reference peak	Dec 20
Peak-to-trough assumption – 'Bsf' (%)	5.0
Peak-to-trough assumption – Highest SF rating level (%)	30.0
Foreclosed sale adjustment (%)	45.0

Source: Fitch Ratings

The HPD Update Process described in the body of this report will be undertaken on an annual rather than a quarterly basis due to data availability.

Germany: Building Savings Loans

German interest-only loans by majority are associated with savings products, primarily building savings contracts whose saved amounts fall under the statutory deposit protection scheme for amounts up to EUR100,000. Fitch will reduce a loan's Current Balance (AR67) by the protected amount if it has a building savings contract attached and sufficient information is provided to allow an analysis of the available savings in individual contracts.

Germany: Property Market Values vs. Lending Values

Fitch expects to receive information on Valuation Amount *(AR136)* and Current Valuation Amount *(AR143)* based on market value, while German lenders occasionally will only provide information on a property's mortgage lending value derived from The Regulation on the Determination of the Mortgage Lending Value ("Beleihungswertermittlungsverordnung") under the German Pfandbrief regulation.

Where Fitch is only provided with the mortgage lending value the agency will apply an adjustment to estimate the market value by analysing, if available, originator-specific data, comparing mortgage lending values and market values. Mortgage lending values have been on average 10% lower than the market value (but differences of up to 20% are possible).

Germany: Debt-to-Income

Mortgage lenders typically conduct a detailed household calculation at the time of loan underwriting, involving various cost and expense factors beyond the loan-related payments. Nevertheless individual income information is in many cases not available to Fitch as it forms part of the calculation but is, on an isolated basis, not considered a crucial factor in loan underwriting.

Different from the process outlined in DTI Calculation, Fitch will assign loans with missing income information to its DTI class 3, as we consider DTI values of ≥30% to <40% reflective of market standards. Fitch may amend the assumption on loans' DTI class allocation on a transaction-specific basis; taking into account peculiarities of a respective lender's underwriting practices.

Greece

Key Assumptions: Greece

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	16.0
FF multiple – Highest SF rating level (x)	2.8
Representative pool WAFF – Highest SF rating level (%)	44.8

Recovery rate	
Reference peak	Dec 08
Peak-to-trough assumption – 'Bsf' (%)	43.0
Peak-to-trough assumption – Highest SF rating level (%)	70.0
Foreclosed sale adjustment (%)	35.0

Source: Fitch Ratings

Ireland

Key Assumptions: Ireland

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	4.0
FF multiple – Highest SF rating level (x)	5.7
Representative pool WAFF – Highest SF rating level (%)	22.8

Recovery rate	
Reference peak	Sep 22
Peak-to-trough assumption – 'Bsf' (%)	24.6
Peak-to-trough assumption – Highest SF rating level (%)	53.0
Foreclosed sale adjustment (%)	35.0

Source: Fitch Ratings

Ireland: Asset Yield

Standard Variable Rate

Over the long term, Fitch assumes that the standard variable rate (SVR) will be around three-month Euribor plus 2.0%-3.0% in rising interest rate scenarios. In stable and decreasing interest rate scenarios, Fitch will assume the SVR margin to be the current rate for the lender minus three-month Euribor as at the pool cut-off date, minus a 50bp haircut. Where the margin of the SVR-Euribor swap is lower than this, or the administration agreement stipulates setting the SVR margin at a lower rate, the agency will use those lower-margin assumptions.

ECB Rate

Fitch assumes that over the long term the ECB rate and Euribor rate are likely to move in tandem as follows:

Asset Index Adjustments

Asset index	Note index	All interest rate scenarios
ECB	EURIBOR	ECB = EURIBOR less 0.25%, subject to a floor of 0%

Source: Fitch Ratings

Ireland: Restructured Loan Portfolios

For portfolios with a high concentration of loans subject to forbearance and restructuring arrangements, and observed historical performance worse than market average, the higher expected FF will be captured through applying an originator adjustment. The 'Bsf' WAFF prior to applying the originator adjustment for such portfolios will likely be higher than that for a prime portfolio due to the presence of restructured loans and loans in arrears. The originator adjustment will be applied to capture potential performance variation not already captured in the 'Bsf' WAFF. As a result of applying significantly higher 'Bsf' FF assumptions for such portfolios, lower stress multiples will be applied, such that FF assumptions at the higher rating levels are not overstated and remain stable through the cycle.

For portfolios containing a high proportion of restructured loans, loans in arrears and a significant proportion of performing loans, the weighting of the performing loans will be factored in when setting an originator adjustment, typically around 1.3x, but will be set on a transaction-specific basis.

Ireland: Restructured Loans FF

For restructured loans where borrowers are current on their payments and have been subject to a restructuring arrangement (AR122='Y'), and the date last in arrears (AR168) is less than 12 months from the pool cut-off date (AR1), Fitch makes certain assumptions as shown in the country-specific assumption sheet for Ireland. The agency assumes that such loans will attract an FF floor equivalent to a loan that is >2.0 and <=3.0 months in arrears.

Furthermore, for loans that fall into this bucket (AR122= 'Y' and AR1 less AR168 is less than 12 months), Fitch may assume an FF adjustment in line with restructured loans where the date last in arrears is >=12 and <24 months from the pool cut-off date – by a manual data adjustment. This adjustment will depend on Fitch receiving sufficient historical loan-level payment string and forbearance data, both for transaction closing and ongoing surveillance.

More specifically, Fitch expects to receive details about the date and types of restructurings applied by the servicer. It will typically make this adjustment where the borrower has demonstrated adherence to an arrangement (e.g. for at least four months or longer as determined on a transaction specific basis) and where a meaningful monthly payment is being made in relation to the original contractual terms. If such additional data is not provided to Fitch or deemed insufficient, this alternative adjustment will not be considered.

If updated loan-level payment string and forbearance data is not provided for ongoing surveillance, Fitch will not expand this analysis to other loans in the pool that were not subject to the alternative adjustment at the initial analysis. Fitch will only assess the performance of the loans that were subject to the alternative adjustment, and determine if the alternative adjustment is still warranted.

Italy

Key Assumptions: Italy

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	7.5
FF multiple – Highest SF rating level (x)	3.4
Representative pool WAFF – Highest SF rating level (%)	25.5

Recovery rate	
Reference peak	Sep 08
Peak-to-trough assumption – 'Bsf' (%)	25.0
Peak-to-trough assumption – Highest SF rating level (%)	43.0
Foreclosed sale adjustment (%)	35.0

Source: Fitch Ratings

Netherlands

Key Assumptions: Netherlands

Foreclosure frequency	Owner-occupied	Buy-to-Let
Representative pool WAFF – 'Bsf' (%)	3.0	4.1
FF multiple – Highest SF rating level (x)	4.3	4.3
Representative pool WAFF – Highest SF rating level (%)	12.9	17.6

Recovery rate		
Reference peak	Dec 20	Dec 20
Peak-to-trough assumption – 'Bsf' (%)	10.0	10.0
Peak-to-trough assumption – Highest SF rating level (%)	40.0	40.0
Foreclosed sale adjustment (%)	25.0	35.0

Source: Fitch Ratings

Netherlands: NHG

For loans secured with NHG guaranteed loans *(AR74=7)*, ResiGlobal Model: Europe only treats the property (and all associated loans) as being covered by NHG if all loans relating to the property are covered by an NHG.

Fitch's payment ratio assumptions for NHG covered loans are set out in the Netherlands' owner-occupied assumption sheet. These assumptions take into account (i) Fitch's expectations regarding the likelihood of the NHG to make payment in response to a claim (i.e. the compliance ratio), and (ii) the 10% loss sharing that has been applied to new loans originated on or after 1 January 2014.

The compliance ratio will be amended downwards according to data provided by the originator, on a transaction-specific basis if the portion of NHG loans in a given portfolio is higher than 33% and the lender-specific data indicate a lower-than-average track record.

Fitch assumes that the Stichting Waarborgfonds Eigen Woningen (WEW) has the ability to satisfy compliant claims falling up to 'AAAsf' and therefore the standard payment ratio does not vary by rating scenario.

Fitch will further amend the payment ratio assumptions in case of transactions that benefit from a contractual obligation of the seller to reimburse the issuer for any losses relating to non-payment by the NHG due to compliance reasons. In such cases, the compliance ratio component of the payment ratio will be assumed to be 100% up to the lower of 'BBB+sf' and the IDR of the seller.

Fitch will implement the increased compliance ratio assumption by completing two ResiGlobal Model: Europe runs. For rating scenarios up to the lower of 'BBB+sf' and the IDR of the seller,

the Multi-Asset Cash Flow Model will be input with the output of ResiGlobal Model: Europe with the increased compliance ratio assumption. For rating scenarios above the lower of 'BBB+sf' and the IDR of the seller, the Multi-Asset Cash Flow Model will be input with the output of ResiGlobal Model: Europe with the standard compliance ratio assumption.

Netherlands: Market Values vs. Foreclosure Values

Fitch expects to receive information on Valuation Amount *(AR136)* and Current Valuation Amount *(AR143)* based on market value. If the data provider advises that these fields are populated with foreclosure values (value that a mortgage lender can reasonably expect to recover if they have to foreclose on the mortgage), Fitch will divide the provided amount by 88.5% to estimate the market value.

If (i) Original Valuation Type is AVM (*AR137=4*); (ii) the AVM provider is Calcasa and (iii) the transaction's eligibility criteria only allows AVMs with a minimum accuracy score of 5, no valuation adjustment will be applied. Valuation adjustments for lower accuracy scores will be determined in line with the section Variations from Criteria and applied using loan-level manual valuation adjustments.

Netherlands BTL: Market Values in a Rented State

Fitch expects to receive information on Valuation Amount *(AR136)* and Current Valuation Amount *(AR143)* based on market value in a rented state. In addition to the above provisions, for BTL, if the data provider advises that these fields are populated assuming the property is vacant, Fitch will further haircut the provided amount by 10% to 15%, to estimate the market value in a rented state depending on information provided by lenders on the typical gap observed between property valuations vacant and in a rented state. The haircut applied will be disclosed in Fitch's rating commentaries.

Netherlands BTL: Commercial Properties

For large loans backed by commercial properties, or where the proportion of commercial properties is material, Fitch may apply the approach detailed under the *EMEA CMBS and CRE Loan Rating Criteria* to derive portfolio recoveries for that proportion. Fitch may assess FF via the Criteria Variation process to address borrower concentration risk.

Netherlands: Asset Yield

Dutch mortgage loans typically pay a fixed rate at inception with an interest reset date in the future. Some banks offer the option to reset to a new fixed or floating rate periodically after a certain date, or floating-rate loans have the option to switch to a fixed rate.

Where the hedging arrangements do not deal with either rate switch or rate reset, the transaction will be exposed to the risk of increased fixed/floating imbalances (if floating-rate loans reset into fixed vis-a-vis floating liabilities) and rate compression (if the new rate is lower than the initial interest rate). This analysis is applied within the Multi-Asset Cash Flow Model.

Fitch assumes that a proportion of borrowers switch their product type:

- In a rising interest-rate scenario, Fitch assumes all floating-rate borrowers will switch to a fixed rate;
- In a decreasing interest-rate scenario, Fitch assumes fixed-rate borrowers will switch to a floating rate until 50% of the initial portfolio balance is made of floating rate loans[3];
- In a stable rate scenario, no switch is assumed.

The product switch is assumed to happen once at the next reset date. As the switch from floating to fixed rate (or the reset from the initial floating rate to a different floating rate) could occur at any time, it is applied in a linear fashion over five years from the latest cut-off date.

Fixed-Rate Loans

In Fitch's analysis, fixed-rate loans with the option to reset and floating-rate loans switching to a fixed rate will do so at the assumed Euribor at the time of reset date + 0.40% for owner-

[3] In the Multi-Asset Cash Flow Model, this means that the portfolio balance at any point in time would be made of maximum 50% of floating rate loans (or any higher percentage corresponding to the initial percentage of floating rate loans).

occupied loans and + 1.0% for BTL loans, subject to a floor of 1.0% and 1.5% respectively. For example, if the initial fixed rate was 5% and the projected Euribor was 4%, the assumed fixed rate upon reset will be 4.40% for an owner-occupied loan.

Floating-Rate Loans

In Fitch's analysis, floating-rate loans (either from closing or fixed-rate loans switching to floating) will be modelled with the following margins:

- In a rising rate scenario, the margin over Euribor will be 0.4% for owner-occupied loans and 1.0% for BTL loans.
- In a decreasing scenario, the margin over Euribor will be the lower of i) the WA margin of floating-rate loans as of the latest cut-off date and ii) 1.5% for owner-occupied loans and 2.0% for BTL loans. For 100% fixed-rate portfolios, the margin of loans assumed to switch to a floating rate will be 1.5% for owner-occupied loans and 2.0% for BTL loans.

Asset Yield Assumptions Netherlands

		Owner-occupied	Buy-to-let
Fixed-Rate Loans			
	Margin over Euribor at reset	0.4%	1.0%
	Floor Rate	1.0%	1.5%
Floating-Rate Loans			
Rising rate scenario	Margin over Euribor	0.4%	1.0%
Decreasing rate scenario	Margin over Euribor	Min[WA margin, 1.5%[a]]	Min[WA margin, 2.0%[a]]

[a] For 100% fixed-rate portfolios, the margin of loans assumed to switch to a floating rate will be 1.5% for owner-occupied and 2.0% for BTL loans.
Source: Fitch Ratings

Both product switch and reset rate assumptions are applied in the analysis of a typical Dutch RMBS (majority of fixed-rate loans, concentration of reset risk several years after closing). If the product mix is different and reset risk more front-loaded, the asset yield analysis conducted at transaction closing will be performed via the Criteria Variation process.

Interest Rate Stresses upon Reset

When modelling high interest-rate scenarios for transactions subject to loan rate reset risk, if the statistical mode of reset dates (calculated on a monthly basis from the latest cut-off date by loan count) occurs after the month at which the long-term upward plateau (as defined in Fitch's *Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria* available in the Interest Rate Stress Model Web User Interface) is reached, Fitch delays the growth to the long-term upward plateau level. In such instances, the long-term upward plateau level is reached 12 months after the statistical mode. This is to address the risk of sharp rises in interest rates (which would make the rated debt more expensive) after loans have reset to relatively lower rates (which would constrain the yield on the assets).

Netherlands: Savings and Investment Mortgages

Under savings (*AR72=7*) and investment mortgages (*AR72=9*), potential set-off exists against the seller (for savings mortgages) or investment provider (for investment mortgages). For the former, sub-participation agreements between seller and issuer mitigate set-off risk if savings balances are periodically transferred to the issuer and applied to amortise the notes. For investment mortgages, Fitch expects invested amounts to be held in a bankruptcy-remote entity and seller's representations on investment products (offered in accordance with all applicable laws and regulations prevailing at the time of origination). These features mitigate set-off risk against the investment provider.

Netherlands: Insurance Mortgages

Under an insurance mortgage loan (*AR72=8*), periodic contributions are made into an insurance product with the aim of accumulating sufficient funds to repay the principal balance at maturity. In case of meaningful amounts (e.g. more than 15% of the portfolio) relating to this product type, Fitch will analyse the specific set-up (e.g. the amounts involved and the respective insurance

providers and their relationship to the seller) and weigh the risk of set-off against the assumption of not taking into account the capital accumulation in its recovery rate calculation.

Netherlands: Non-Prime

Where a significant portion of obligors exhibit adverse credit characteristics, Fitch captures the higher FF expected for these collateral portfolios with its originator adjustment. In addition, Fitch will apply a 35% increase to the FF for loans to borrowers with adverse credit markers assigned by the Bureau Krediet Registratie. As a result of applying significantly higher 'Bsf' FF assumptions to non-prime portfolios, Fitch applies compressed stress multiples as per the applicable sector-specific assumption sheet.

Portugal

Key Assumptions: Portugal

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	9.0
FF multiple – Highest SF rating level (x)	3.2
Representative pool WAFF – Highest SF rating level (%)	28.8

Recovery rate	
Reference peak	Jun 22
Peak-to-trough assumption – 'Bsf' (%)	20.0
Peak-to-trough assumption – Highest SF rating level (%)	50.0
Foreclosed sale adjustment (%)	25.0

Source: Fitch Ratings

Spain

Key Assumptions: Spain

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	7.0
FF multiple – Highest SF rating level (x)	3.3
Representative pool WAFF – Highest SF rating level (%)	23.1

Recovery rate	
Reference peak	Mar 08
Peak-to-trough assumption – 'Bsf' (%)	25.7
Peak-to-trough assumption – Highest SF rating level (%)	53.0
Foreclosed sale adjustment (%)	25.0

Source: Fitch Ratings

Asset Spread over Index

In Fitch's analysis, the asset spread of mortgage portfolios that comprise at least 10% of loans indexed to Indice de Referencia de Préstamos Hipotecarios (IRPH) is adjusted upwards. A 1% additional spread per annum is added to the margin of IRPH loans. This analysis is applied within the Multi-Asset Cash Flow Model.

Switzerland

References in the body of this report to euros are instead applied as Swiss francs.

The base FF derivation described in the body of this report will be derived from the Swiss FF Matrix, shown in the country-specific assumption sheet. The Swiss FF Matrix solely captures the impact of borrower-level OLTV, incorporating the data field Original Balance *(AR66)*, which Fitch expects to be populated with the loan balance as at the most recent loan underwriting. In case these data are not available then this field may instead be populated as per the Current Balance *(AR67)*. Given the specific characteristics of property financing in Switzerland, DTI figures are not considered to be a good indicator for the ability to pay and income information is often not available to Fitch.

Key Assumptions: Switzerland

Foreclosure frequency	
Representative pool WAFF – 'Bsf' (%)	2.3
FF multiple – Highest SF rating level (x)	6.1
Representative pool WAFF – Highest SF rating level (%)	14.0

Recovery rate	
Reference peak	Dec 20
Peak-to-trough assumption – 'Bsf' (%)	10.0
Peak-to-trough assumption – Highest SF rating level (%)	40.0
Foreclosed sale adjustment (%)	15.0

Source: Fitch Ratings

Data Adjustments

Fitch may manually amend amounts reported in data field Arrears Balance *(AR169)* in case such amounts are considered to be reflective of temporary technical arrears. This data adjustment will be applied on the basis that manual payment methods used for Swiss mortgages may result in high levels of temporary technical arrears that are not indicative of the future loan performance.

Variations from Criteria and Disclosures

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.

Transaction-Specific Disclosures

Fitch expects to disclose the following items in its initial transaction reports and/or Rating Action Commentaries (RACs):

- application of (and any amendments to) macroeconomic adjustments, including the level of the adjustments;
- application of alternative default distributions when modelling pro rata synthetic transactions with a tenor shorter than its reference portfolio's;
- application of a Performance Adjustment different from the value calculated by ResiGlobal Model: Europe;
- application of a payment holidays stress; and
- for Netherlands BTL, value of the haircut applied to estimate the value of the property in a rented state when Fitch has been only provided with property values assuming the property is vacant.

Fitch will typically use the same assumptions for assigning and maintaining ratings. Material changes will be disclosed in subsequent RACs.

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. In addition, ratings within the scope of these criteria are subject to the limitations listed in Fitch's *Global Structured Finance Rating Criteria*.

Rating Assumption Sensitivity

At the time of assigning initial ratings, Fitch conducts a Rating Assumption Sensitivity in its Multi-Asset Cash Flow Model, which provides an insight into the MIR sensitivities to hypothetical changes in WAFF and/or WARR assumptions. The typical sensitivity scenarios are:

- 15% and 30% increase in WAFF of the mortgage portfolio relative to the WAFF output of ResiGlobal Model: Europe;
- 15% and 30% decrease in WARR of the mortgage pool relative to the WARR output of ResiGlobal Model: Europe; and
- 15% increase in WAFF and 15% decrease in WARR; and 30% increase in FF and 30% decrease in WARR of the mortgage pool relative to the output of ResiGlobal Model: Europe.

The MIR sensitivities, based on such assumptions, are only indicative of some of the potential outcomes and do not consider other risk factors to which the transaction is exposed. The tables below indicate the additional stresses required for the WAFF and WARR assumptions to cause rating downgrades, for example asset pools.

Rating Sensitivity to Increase in WAFF

	15% increase in WAFF		30% increase in WAFF	
Original model-implied rating	**Asset pool 1**	**Asset pool 2**	**Asset pool 1**	**Asset pool 2**
AAAsf	AA+sf	AA+sf	AAsf	AAsf
AAsf	AA-sf	AAsf	A+sf	A+sf
Asf	A-sf	Asf	BBBsf	BBB+sf
BBBsf	BBBsf	BBBsf	BBB-sf	BBB-sf
BBsf	BB-sf	BBsf	B+sf	B+sf
Bsf	NRsf	NRsf	NRsf	NRsf

Source: Fitch Ratings

Rating Sensitivity to Decrease in WARR

	15% decrease in WARR		30% decrease in WARR	
Original model-implied rating	**Asset pool 1**	**Asset pool 2**	**Asset pool 1**	**Asset pool 2**
AAAsf	AA+sf	AA+sf	AA-sf	AA-sf
AAsf	A+sf	AA-sf	Asf	A-sf
Asf	BBB+sf	BBB+sf	BBB-sf	BBB−sf
BBBsf	BBBsf	BBB-sf	BB+sf	BBsf
BBsf	BB-sf	BB-sf	Bsf	NRsf
Bsf	NRsf	NRsf	NRsf	NRsf

Source: Fitch Ratings

Rating Sensitivity to Increase in WAFF and Decrease in WARR

	15% increase in WAFF and 15% decrease in WARR		30% increase in WAFF and 30% decrease in WARR	
Original model-implied rating	**Asset pool 1**	**Asset pool 2**	**Asset pool 1**	**Asset pool 2**
AAAsf	AAsf	AA+sf	A+sf	A+sf
AAsf	Asf	A+sf	A-sf	BBB+sf
Asf	BBBsf	BBB-sf	BB+sf	BBsf
BBBsf	BBB-sf	BB+sf	BBsf	B+sf

Rating Sensitivity to Increase in WAFF and Decrease in WARR

	15% increase in WAFF and 15% decrease in WARR		30% increase in WAFF and 30% decrease in WARR	
BBsf	B+sf	B+sf	B-sf	NRsf
Bsf	NRsf	NRsf	NRsf	NRsf

Source: Fitch Ratings

The Rating Assumption Sensitivity is published in Fitch's rating report for each new RMBS transaction.

Appendix 1: Data Fields

ECB Template Fields Used in Fitch RMBS Analysis

Field number	Field name	Fitch applicability
AR1	Pool cut-off date	All
AR3	Loan identifier	All
AR7	Borrower identifier	All
AR8	Property identifier	All
AR16	Foreign nationals[a]	All
AR21	Borrower's employment status	All
AR26	Primary income	All except Dutch BTL
AR27	Income verification for primary income	All except Dutch BTL
AR28	Secondary income[a]	All except Dutch BTL
AR35	Last county court judgements or equivalent – year[a]	All
AR36	Bankruptcy or individual voluntary arrangement flag[a]	All
AR38	Bureau Krediet Registratie 1 to 10 registration date[a]	Netherlands
AR55	Loan origination date	All
AR56	Date of loan maturity	All
AR58	Origination channel/arranging bank or division[a]	All
AR59	Purpose	All
AR64	Subsidy[a]	Spain
AR66	Original balance	All
AR67	Current balance	All
AR70	Payment frequency	All
AR71	Payment due	All
AR72	Payment type	All
AR74	Type of guarantee provider[a]	France, Netherlands
AR75	Guarantee provider[a]	France, Netherlands
AR77	Subsidy received[a]	Spain
AR80	Prior balances[a]	All
AR82	Pari passu loans[a]	All
AR87	Maximum balance[a]	All
AR107	Interest rate type	All
AR109	Current interest rate	All
AR110	Current interest rate margin	All
AR113	Revision margin 1	All
AR114	Interest revision date 1	All
AR115	Revision margin 2	All
AR117	Revision margin 3	All
AR120	Final margina	All
AR122	Restructuring arrangement[a]	All
AR128	Geographic region list[a]	All
AR129	Property postcode	All
AR130	Occupancy type[a]	All
AR131	Property type	All
AR136	Valuation amount	All
AR137	Original valuation type	All
AR138	Valuation date	All

ECB Template Fields Used in Fitch RMBS Analysis (Cont.)

Field number	Field name	Fitch applicability
AR143	Current valuation amount	All
AR144	Current valuation type	All
AR145	Current valuation date	All
AR151	Date of sale[a]	Defaulted loans
AR154	Gross annual rental income[a]	Dutch and Irish BTL
AR166	Account status	All
AR168	Date last in arrears[a]	All
AR169	Arrears balance	Arrears loans
AR177	Default or foreclosure	Defaulted loans
AR178	Date of default or foreclosure	Defaulted loans
AR179	Sale price lower limit	Defaulted loans

[a] ECB Priority = "Optional", see section Data Requirements, Review and Adjustments
Source: Fitch Ratings, ECB RMBS Template v29 (24 July 2019)

Appendix 2: Data Sources

Criteria Development

The following data have been used in the development of the criteria assumptions:

Representative Pool FF Rates

- Historical arrears, annual and cumulative default rates from Fitch-rated and non-Fitch-rated RMBS transactions.
- Macroeconomic data and mortgage market performance from national central banks, national statistical organisations and comparable markets and countries.

Loan-Level FF Adjustments

- Regression analysis of loan performance versus loan-level attributes sourced from the European Datawarehouse and Fitch's internal databases.
- Regional population distributions from Eurostat.

House Price Indices

- Belgium: Statbel
- France: Perval, Paris' notaries (Ile de France region)
- Germany: Bulwiengesa AG
- Greece: Bank of Greece
- Ireland: Central Statistics Office, Eurostat, OECD, Department of Housing, Local Government and Heritage and Central Bank of Ireland
- Italy: Scenari Immobiliari
- Netherlands: PBK index (Prijsindex Bestaande Koopwoningen) compiled by the Central Bureaus of Statistics (CBS) and Kadaster (Dutch Land Registry Office)
- Portugal: Instituto Nacional De Estatistica
- Spain: Ministerio de Fomento
- Switzerland: Wüest Partner AG

Foreclosed Sale Adjustment

- Historical loan-level data from servicers of Fitch-rated RMBS transactions, information provided by originators and information from comparable markets and countries.
- Housing stock.
- Housing completions.
- Germany: Analysis of foreclosed sale adjustments provided by vdpExpertise GmbH.

Valuation Adjustments

- Netherlands: Analysis of Automated Valuation Model valuations provided by Calcasa.

Illiquid Property Adjustment Thresholds

- Property values within RMBS transactions as per the ED and Fitch's internal databases.

Foreclosure Assumptions

- Observations from servicers of Fitch-rated RMBS.

Guarantee Payments

- Netherlands: NHG compliance ratios reported by Fitch-rated RMBS servicers.

Cash Flow Model Assumptions

- Historical prepayment rates and default distributions from Fitch-rated and non-Fitch-rated RMBS transactions.
- Servicing cost observations from Fitch-rated RMBS transactions and servicers.

Appendix 3: Related Criteria

Related Criteria

Global Structured Finance Rating Criteria (March 2023)
Structured Finance and Covered Bonds Counterparty Rating Criteria (March 2023)
Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria (December 2022)
Structured Finance and Covered Bonds Country Risk Rating Criteria (May 2023)
Covered Bonds Rating Criteria (June 2023)
SME Balance Sheet Securitisation Rating Criteria (October 2021)

Source: Fitch Ratings

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