APAC Residential Mortgage Rating Criteria

Sector-Specific

This report replaces the APAC Residential Mortgage Rating Criteria dated 1 June 2022

Related Criteria

See Appendix 3

Model

ResiGlobal Model: APAC

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 Australia, New Zealand and Japan.

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 (RR) outputs of the ResiGlobal asset model are also applied to the analysis of covered bonds backed by residential mortgage loans in Australia, New Zealand and Japan. The house price decline (HPD) and foreclosed sale adjustment (FSA) assumptions of these criteria are also applied to the analysis of SME balance-sheet securitisations backed by residential mortgage loans in the countries listed above.

Key Rating Drivers

Asia-Pacific (APAC) RMBS ratings are driven primarily by an analysis of the issuer's assets relative to liabilities. However, in certain transactions, the maximum rating may be constrained by operational risk considerations or the highest structured finance achievable rating in a country, as per Fitch's *Structured Finance and Covered Bonds Country Risk Rating Criteria*.

Operational Risk: Origination practices and servicing capabilities can affect asset performance beyond the loan and borrower attributes. Fitch therefore reviews the activities of originators and servicers to assess their influence on transaction performance. Fitch reviews the mortgage servicer's capabilities and assesses consistency with market standards.

Asset Analysis: Fitch's key parameters for assessing mortgage portfolio performance are: (i) FF rates, determined, where applicable, by the current loan-to-value ratio (CLVR) (or original loan-to-value ratio (OLVR) for Japan), the debt-to-income (DTI) ratio and borrower and loan characteristics; and (ii) RRs, derived from the indexed scheduled/current LVR, market value declines (MVD) of foreclosed properties, foreclosure costs and foreclosure timing. Fitch's asset analysis determines a portfolio's expected loss at each rating level.

Liability Analysis: Fitch's Multi-Asset Cash-Flow Model is tailored to capture key structural features, such as a transaction's liability structure and priority of payments. The model tests the ability of cash flow generated from the assets to meet the defined payment obligations in different stress scenarios. In addition, Fitch applies cash flow modelling assumptions within the model; that is, interest rate stresses, default distributions and prepayment scenarios.

Macroeconomic Factors: Residential mortgage performance is driven by a country's macroeconomic environment as well as housing and mortgage market conditions. Fitch assesses these factors when setting criteria assumptions for our asset and cash-flow analysis, reflecting changes in market dynamics over time. The macroeconomic environment is also assessed when rating and monitoring transactions to form a view of the outlook for transaction performance.

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Criteria Prerequisites

Criteria Application

These criteria are applicable to portfolios of residential mortgage loans in Australia, Japan and New Zealand. 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.

In reviewing a new transaction, if the mortgage portfolio contains characteristics that are uncommon in the market, Fitch may apply additional stress, cap the rating of the transaction or choose not to rate the transaction. 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. For further details of criteria application for Japan, please see Japan Criteria Scope.

In general, we expect originator-specific historical performance data to be provided for five years. However, in the case of a portfolio with standard product characteristics and a lender that demonstrates robust and consistent lending practices, Fitch's country-specific assumptions may facilitate the assignment of a rating where the provision of originator-specific data is less than the generally expected amount. The availability of comparable market performance data may serve as a proxy for originator-specific data. Where data is deemed insufficient, Fitch may cap the rating at a level below 'AAA' or may decline to rate the transaction at all.

Originator Review

These criteria are predicated on origination practices being in line with market standards, 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 where a third-party assessment report is not available. Fitch carries out originator and file reviews of repeat issuers and for revolving transactions at least once every two years, which may not coincide with a new transaction or surveillance review. The outcome of the originator review informs Fitch's determination of the Criteria Application and the quantification of the Originator Adjustment. The originator review focusses on the following key areas:

- loan sourcing; for instance, branch network versus intermediaries, such as brokers;
- assessment of the borrower's creditworthiness;
- property appraisal procedures;
- technology;
- staffing; and
- quality control framework.

For the loan file review, Fitch completes a targeted review of a sample of the originator files to better understand operational implementation and consistency of the originator's practices and policies.

Servicer Review

The purpose of the initial servicer review is to form an opinion about the operational ability of the servicer to undertake its contractual administration and collection activities in accordance with the relevant market standards. Fitch reviews the servicing practices of servicers at least every two years, which may not coincide with a new transaction or surveillance review. The reviews aim to identify whether there have been any material changes that may affect the servicer's ability to undertake administration and collection activities. Fitch may request ad hoc information from the servicer in relation to any transaction, sector or country-wide performance trends.

In addition to assessing the operational abilities of the servicer in place, Fitch also considers the extent to which transaction documentation and structural features mitigate servicing continuity risk, as described in the *Structured Finance and Covered Bonds Counterparty Rating Criteria*.

Data Requirements, Review and Adjustments

Historical Performance Data

Fitch reviews loan-by-loan collateral information to assess the credit quality of a mortgage loan portfolio. The collateral information varies depending on the mortgage loans' country of origin.

Fitch reviews the following historical mortgage performance information (where available and depending on the jurisdiction) from lenders when rating new transactions:

- arrears data and default data aggregated at the lender level and by product;
- prepayment data; for example, dynamic voluntary prepayments;
- data on loan or aggregate-level recoveries or losses associated with foreclosed properties; and
- origination data aggregated at the lender level and by product.

For a portfolio with standard product characteristics and a lender that demonstrates robust and consistent lending practices, Fitch's country-specific assumptions may facilitate the assignment of a rating where the provision of originator-specific data is less than the generally expected amount. The availability of comparable market performance data may serve as a proxy for originator-specific data.

Loan-Level Data

Fitch requests loan-by-loan data to be provided on a regular basis for all rated transactions following transaction closing.

Fitch expects the fields listed in Appendix 1: Data Fields to be made available to Fitch for the initial and each subsequent cut-off date (as defined in the transaction documentation). Fitch expects to be provided with data for all fields, except for non-applicable country-specific fields, preferably in the Fitch-requested format or, alternatively, in a format selected by the issuer that is sufficiently comparable for Fitch to conduct our analysis.

Transaction Performance Data

The loan-by-loan information provided after closing may contain fewer details about the original borrower and property characteristics than that provided prior to the transaction closing. In combination with the latest loan-by-loan information, Fitch will, where possible, use detailed data about the borrower and property characteristics that were provided prior to closing or as part of prior surveillance.

Fitch reviews the servicer's reports with the following asset performance data with respect to each collection period, where available:

- end-of-period asset balance;
- end-of-period delinquent asset balance by delinquency category;
- principal collections;
- interest collections;
- balance of newly defaulted assets; and
- recovery amounts.

In addition, Fitch reviews the issuer's trustee or investor reports with the following data with respect to each note payment date, where available:

- end-of-period note balances;
- principal distributions to noteholders;

- interest distributions to noteholders;
- end-of-period cash account balances;
- period excess spread (ExS); and
- other issuer income and distributions.

A summary of performance data is regularly reported at www.fitchratings.com

Data Review

When assigning new ratings, Fitch expects, where possible, to receive a third-party assessment report that tests the accuracy of the transaction's loan-level data versus the originator's systems and documents; for example, the 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 a file review; see Originator Review.

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

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 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 rating.

Where the overall data provision is deemed to be sufficient, but individual items of loan-level data are identified as missing or do not meet expected standards, 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. 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 on 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 the ResiGlobal Model: APAC 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. The asset model produces FF and RR assumptions that are applied to the pool balance within the Multi-Asset Cash Flow Model.

The 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.

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

Unless otherwise indicated in the *Covered Bonds Rating Criteria*, Fitch's analysis of covered bonds backed by residential mortgage assets uses the FF and RR outputs of the asset model (and the corresponding assumptions), as described in this report. Cash flow analysis is completed using the covered bond cash flow model, which is described in the Covered Bonds Rating Criteria.

Model Application

For RMBS ratings, the asset and multi-asset cash flow models will be completed for a given transaction upon the initial assignment of ratings. The asset and multi-asset cash flow models will be updated for surveillance purposes (except in the circumstances listed below) to reflect changes in portfolio composition, liability structure, reported performance and Fitch's assumptions.

The asset model and multi-asset cash flow models 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; that is 'AAAsf' or non-model related rating cap;
- Fitch does not expect any changes in asset composition or asset performance since the last asset model analysis to result in a change to the MIR produced by the Multi-Asset Cash Flow Model;
- Fitch does not expect any changes in cash flow distributions since the last multi-asset cash-flow model analysis to result in a change to the MIR produced by the Multi-Asset Cash Flow Model;
- Fitch does not expect any changes to asset or cash flow assumptions – including changes to foreign-currency swap margins or applicable negative interest rate or foreign-currency stresses – since the last asset or multi-asset cash flow analysis to result in a change to the MIR produced by the Multi-Asset Cash Flow Model; and
- the surveillance rating committee determines that updated asset analysis and cash-flow analysis is not relevant to the rating.

For transactions featuring revolving periods, the asset and multi-asset cash flow models may not be updated for surveillance purposes during the revolving period where the above conditions, except for the first condition, are met.

Fitch will conduct more frequent model updates when the agency 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 a material change in applicable asset or multi-asset cash flow model assumptions, unless it is not expected to result in a change to the MIR produced by the Multi-Asset Cash Flow Model.

Rating Determination

RMBS ratings are determined by a committee. The MIR, which also factors in the applicable concentration tests, 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 related criteria or the country-specific section of this criteria, or based on transaction-specific structural features or asset concentration. This rating cap is not factored into the MIR produced by the Multi-Asset Cash Flow Model. 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 updated analysis results in a MIR of no more than three notches below the current note rating (for instance, 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 or, for a revolving transaction, credit enhancement is expected to build when the revolving period stops. This is not applicable when the MIR is lower than 'B-sf'.

- 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 updated analysis results in a MIR that is greater than the current rating and Fitch expects the MIR to 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].
- A MIR lower than 'B-sf' indicates that the note is not able to pay in full in all 18 cash-flow model scenarios tested at the 'B-sf' stress level. In such a 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, for instance, existing credit enhancement and ExS in excess of expected losses.
- For new and existing ratings of warehouses, the final rating considered appropriate by the committee may be up to three notches above or below the stressed portfolio MIR, with an upper limit of the actual portfolio MIR and a lower limit of the portfolio parameter MIR.

Warehouses and Revolving or Substituting Periods

The asset model and Multi-Asset Cash Flow Model address the modelling of the amortisation period of a transaction.

For transactions featuring revolving periods, or other material asset substitution options, the model inputs will be amended to reflect the potential portfolio at the commencement of the amortisation period, taking into account the transaction-specific portfolio parameters.

Typical portfolio parameters in Australia and New Zealand are linked to:

- maximum borrower characteristics; for example, the proportion of borrowers with low documentation or adverse credit history, self-employed borrowers and non-residents;
- maximum geographic distribution;
- maximum portfolio weighted-average (WA) CLVR ratios and distributions, including limits on the maximum proportion of the portfolio in certain LVR buckets; for example, above 90%;
- maximum loan type, loan purpose and product type; and
- maximum property characteristics; for example, investment properties.

[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 to 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 a MIR of 'BB-sf', if other quantitative and qualitative factors are considered as per the second bullet point under 'Rating Determination'.

[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 a MIR of 'AAsf', if other quantitative and qualitative factors are considered as per the second bullet point under 'Rating Determination'.

In addition to adequate portfolio parameters that limit concentration, Fitch expects transactions with revolving periods to include effective mechanisms to stop the purchase of additional assets upon asset underperformance. Typical triggers are linked to:

- arrears levels;
- cumulative default levels;
- note charge-offs.

Warehouse structures may build an asset portfolio over time or see significant asset reductions from sales to alternative securitisations. In assessing these transactions, Fitch will request that the originator provide details of assets in the portfolio, both actual and expected. Fitch will rely on the portfolio data provided by the originator, even if the assets are expected rather than actual. The agency will assume that by the end of the revolving period the notes would be backed by a portfolio that has seen some negative migration towards the outer bounds allowed for in the transaction documentation.

Fitch also expects transaction documentation to include a notification obligation in case any material changes in relation to the origination and servicing procedures are implemented.

The credit protection levels of revolving or substituting transaction structures will be higher than those of static transactions to mitigate the risk of portfolio deterioration towards the maximum portfolio parameters. On every replenishment or substitution date, Fitch expects to receive the same loan-by-loan information for additional loans as for the loans initially securitised.

Fitch expects revolving periods to be less than or equal to five years and for longer revolving periods to be mitigated by a stable product history and eligibility criteria that maintain the portfolio's characteristics during the revolving period. Fitch expects to be notified of all portfolio changes.

Fitch monitors revolving transactions by reviewing performance data. Surveillance during a transaction's revolving period requires information regarding the evolution of the portfolio composition. This is due to the replenishment feature and absence of deleveraging, which means the structure does not build up additional CE during the revolving period. Other aspects, such as originator repurchases of delinquent collateral, are also important in assessing the effectiveness of triggers in controlling revolving-period risk.

Revolving Pool Concentration Test

Warehouse transactions typically have the ability to sell out large parcels of loans in bulk (term out), which will reduce the total pool size and expose the transaction to absolute low levels of dollar subordination. To address this, Fitch reviews the minimum dollar subordination amount available to each tranche during the life of the transaction against the revolving pool concentration test, calculated as 300 multiplied by the average obligor loan balance and the maximum of (i) the portfolio loss without the benefit of lenders' mortgage insurance (LMI) and (ii) the Portfolio Loss Floor without the benefit of LMI at the relevant rating.

The test is conducted at the time of new ratings and in the ongoing surveillance analysis where the asset model is run.

For the avoidance of doubt, revolving pools are also subject to the Large Obligor-Concentration Test.

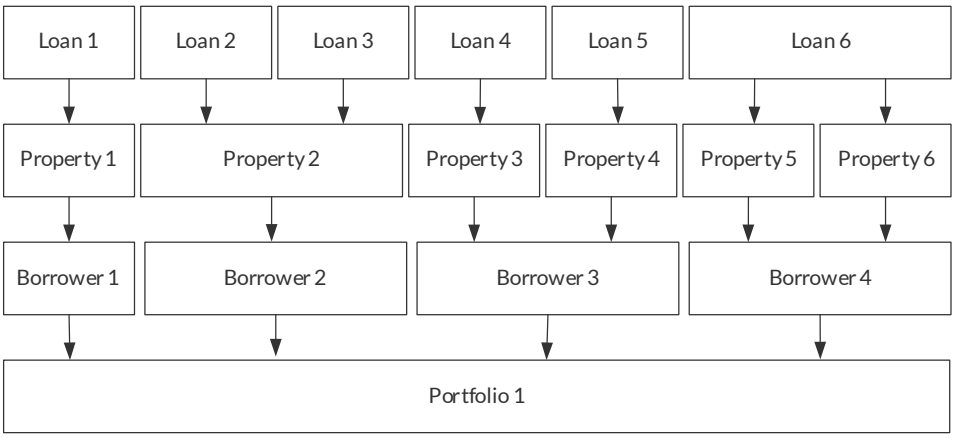
Asset Model – Loan Aggregation

The Fitch data template requires each loan (or loan part) to be shown as a separate line item with a unique loan ID (DT4) with a corresponding property ID (DT13, DT20, DT27, DT34 and DT41) and borrower ID (DT5).

Fitch's asset model performs calculations at loan, property and borrower levels, as described in this report. Property-level calculations are completed utilising unique property IDs at the security level, and aggregated at the loan level and at the borrower level. Borrower-level calculations aggregate all loans within a portfolio that have the same borrower ID.

If the underlying lending arrangement consists of one loan secured by multiple properties, then Fitch prefers data relating to the multiple properties to be populated individually in the Fitch data template (fields DT13-DT47) and recorded at the full value of the property with the corresponding property ID. Where the issuer is unable to provide this reporting, Fitch will continue to accept the property information aggregated into a single property entry (fields DT13-DT19) with the security details representing the property with the largest security value.

Asset Model - Loan Aggregation Diagram



Source: Fitch Ratings

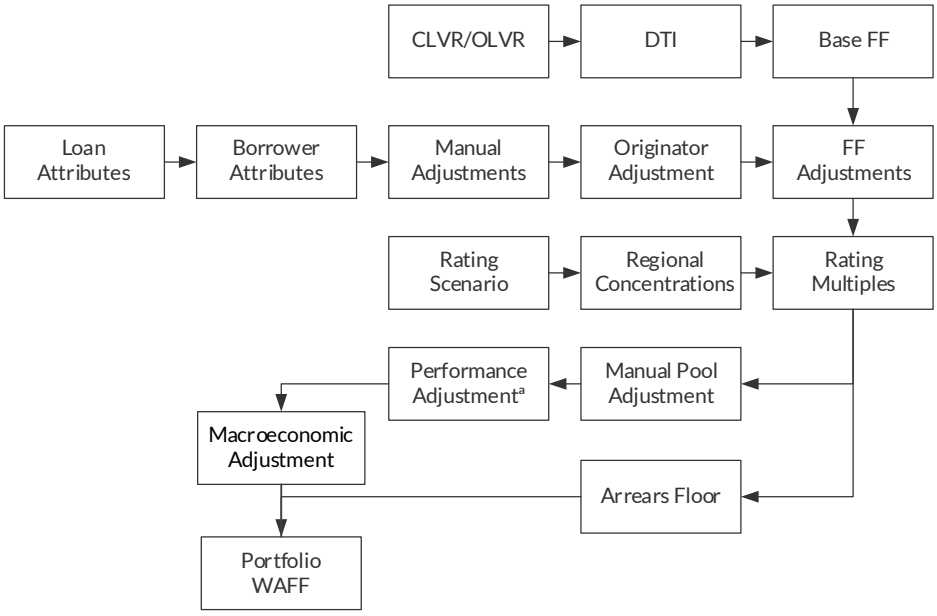
The asset model does not take into account financial obligations of borrowers relating to loans not included in the portfolio, unless such obligations are secured upon the same property as the loans in the portfolio and rank in priority. Fitch expects loans that are secured on properties that are subject to prior charge amounts (DT12) to be reported in the loan-level data template. Such balances are taken into account in the asset model as described in this report.

Asset Model: Foreclosure Frequency

Fitch's asset model calculates loan-level FF assumptions. The asset model outputs a portfolio weighted-average FF (WAFF) for each rating scenario by notch.

The portfolio WAFF is calculated within the asset model for each rating scenario by applying the steps summarised below.

Asset Model - Foreclosure Frequency Diagram



[a] Applies to Japan only
Source: Fitch Ratings

'Bsf' Representative Pool WAFF

For each country, 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.

The 'Bsf' representative pool WAFF for Australia and Japan has been derived from an analysis of country-specific historical data and for New Zealand from the analysis of Australian historic data with an additional country adjustment of 10%. The 'Bsf' representative pool WAFF has been combined with forward-looking views and a limited margin of safety over historical data and Fitch's expectations.

Country-specific representative pool 'Bsf' WAFF assumptions are shown in the country-specific sections of this criteria report. The country-specific representative pool 'Bsf' WAFF will be reviewed and may be amended in the event of significant and long-lasting changes in macroeconomic or performance outlook for the given country, 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-specific representative pool compositions for the purpose of calibrating the criteria assumptions. The pools, comprise loans with a mix of borrower and loan attributes that are intended to be broadly representative of the average portfolios that are addressed within the scope of the criteria.

Current Balance

The borrowers' current loan balance is captured in the current balance (DT8). Where the current loan balance is negative, representing a credit balance (that is, a deposit), the credit balance is offset against the largest debit loan balance and if a credit balance remains, then the remaining credit balance is offset against the second largest debit loan balance and so on.

Base FF

A loan-level base FF is derived from the country-specific FF matrix. For Australia, Japan and New Zealand, the FF matrix captures the expected impact of borrower-level CLVR (OLVR for Japan), and borrower-level DTI within the loan-level FF assumption.

Australia and New Zealand have a separate FF matrix for conforming and non-conforming mortgages. Should a borrower have a mixture of conforming and non-conforming loan accounts, the borrower, and consequently all loans linked to the borrower, will be assessed as non-conforming.

The FF matrix for each country is shown in the country-specific assumption sheet.

CLVR/OLVR Calculation

CLVR is calculated at the borrower-level by dividing (i) the borrower's current loan balances into (ii) the most recent valuation of the borrower's properties.

- The borrower's current loan balances are added together. For each loan, the current balance (DT8) is added to the prior charge amount (DT12), if any.
- The most recent security value (DT14, DT21, DT28, DT35 and DT42) of the borrower's properties is summed. This may be the security valuation at settlement or, if the lender has subsequently provided an updated security valuation, the updated security value.

The model allows for a manual calculation of CLVR to be applied via the CLVR_override (DT9). Should the CLVR override have different values for loan accounts within a borrower group, the CLVR override corresponding to the most recent loan origination date (DT6) will be used.

The CLVR override is used to apply the OLVR for Japanese portfolios. The CLVR override is also typically used when the number of properties securing the same loan exceeds the reporting limitation of the APAC Fitch RMBS Data Template.

DTI Calculation

DTI is calculated for Australia, Japan and New Zealand 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 scheduled loan balances (or current balance if scheduled loan balance is not provided), the remaining term to maturity of the loan and the applicable loan interest rate, and aggregated for the borrower. The monthly debt payment is calculated assuming a fully amortising constant periodic payment.
- The scheduled balance (DT10) is used and is added to the prior charge amount (DT12), if any.
- The loan-level remaining term to maturity is the difference between the pool cut date and date of loan maturity (DT7) with a minimum value of one month.
- The loan-level interest rate assumption is equal to the greater of (i) the current interest rate (DT60), or (ii) the current interest rate less the applicable index spot rate at the pool cut date plus the assumed country-specific reference rate. The country reference rates are specified in the relevant country-specific assumption sheet.
- Borrower income is taken as the annual salary (DT51) of the borrowers divided by 12. Where the borrower has multiple loans, the income data is taken from the loan with the latest loan origination date. 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 conforming loans where borrower annual salary is not provided or equal to zero, and the documentation type (DT55) is low documentation, the asset model assumes a DTI Class 8. For all other scenarios where the borrower annual salary is not provided or equal to zero, the No DTI class will be applied. The assignment of DTI classes for loans where borrower annual salary is not provided may be amended on a transaction-specific basis (see Data Adjustments).

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

DTI Classes

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
DTI ≥ (%)	0	20	25	30	35	40	45	55
DTI < (%)	20	25	30	35	40	45	55	

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-specific basis and the applicable values are shown in the country-specific assumption sheet.

FF adjustments apply to the following variables:

- Non-resident (DT50): loans where at least one borrower is not a resident for tax purposes are expected to be reported as non-resident.
- Loan purpose (DT52): loan purpose will be overridden with 'investment loan' in instances where there is more than one property linked to a loan and the loan purpose is originally populated as owner occupied for Australia and New Zealand. Where there is missing data, the 'no data' adjustment is applied.
- Interest only (DT53): applicable for Australia and New Zealand, where the magnitude of the adjustment depends on whether the loan converts to a principal and interest repayment schedule at the interest-only expiry date, and the remaining term of the principal and interest repayment schedule.
- Documentation type (DT55): low documentation adjustment will be applied for mortgage products that permit reduced income verification.
- Employment status (DT56): applicable for Australia and New Zealand, where documentation type (DT55) is equal to 'low doc', the employment status of 'self-employed' will be applied. Where there is missing data, the higher of (i) the 'no data' adjustment and (ii) 1+ (the proportion of self-employed/all employment status (excluding no data) x (self-employed adjustment-1)) will be applied.
- Overdraft loan (DT57): applicable in New Zealand where the mortgage is linked to an at-call overdraft account where cross default provisions apply. Applied where the mortgage either (i) does not have an interest-only period (DT53) or (ii) the remaining term after the expiry of the interest-only period (DT53) is greater than or equal to one year.
- First-time home buyer (DT59): Adjustment is applicable in Australia and New Zealand for mortgages that have a seasoning less than or equal to 24 months and the borrower is classified as a first home buyer. Where there is missing data and the loan has seasoning less than or equal to 24 months, apply the 'no data' adjustment.
- Prior defaults (DT62): applicable for Australia and New Zealand where the magnitude of the adjustment is dependent on the number of defaults recorded on the borrower's credit file.
- Bankruptcy, individual voluntary arrangement or equivalent (DT63): applicable for Australia and New Zealand where any bankruptcies or debt agreements, court judgments, or personal insolvency agreements are recorded on the borrower's credit file. Where 'bankruptcy, individual voluntary arrangement or equivalent' is equal to 'yes' for a loan account, the borrower, and consequently all loans linked to the borrower, will be assessed as non-conforming.

A value of '1.0' or '-' for a specific attribute within the country-specific assumption sheet denotes that Fitch has determined that the attribute is not significant to the FF performance of a loan

(versus the base FF) or relevant for the country. In such cases, no increase or decrease is applied to the FF.

Manual Loan Adjustments

The asset model 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-specific assumption sheet. The individual loans are identified in the loan-level data tape input to the asset model, while the magnitude of the adjustment is input to the asset-model. Such adjustment will be treated as per the section variations from criteria.

In case the data review identifies the need for a data adjustment for individual loans, this will be applied by amending the loan-level data file prior to inputting it to the asset model.

Originator Adjustment

Fitch's representative pool FF assumes the underwriting criteria and origination practices of a standard lender originating mortgages in a particular country. An originator adjustment is applied on a portfolio-wide basis to reflect expected FF performance differences for a given portfolio (relative to the market standard) that arise from lender origination factors that are not observable from the reported loan-level 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 transaction, as such factors are embedded in mortgages at origination. However, Fitch may amend the originator adjustment where additional information received over time indicates that 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 where, for example, the lender's origination practices changed materially over time and the portfolios were originated in different time periods.

An originator adjustment of 1.0x is associated with standard lending practices for a given country. Factors that contribute to an originator adjustment different from 1.0x include:

- originator-specific historical performance data that materially varies from comparable market averages or comparable peer data – in which case the applicable originator adjustment is based on observed performance variations;
- originator-specific historical performance data that is limited in quantity – in which case the applicable originator adjustment is derived on a conservative basis from an analysis of originator adjustments applied to comparable originators in the same country and sector.
- origination practices that deviate from relevant market standards – in which case the originator adjustment takes 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 Multiple

For each country, 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

Fitch defines standard FF rating multiples – those without regional concentration – at each rating category on a country-specific basis and the applicable values are shown in the country-specific assumption sheet.

Rating multiples are defined for standard conforming and, where applicable, non-conforming portfolios for each country, as shown in the country-specific assumption sheet. For mixed pools of conforming and non-conforming loans, the asset model will apply the standard conforming rating multiple on the conforming loans and the standard non-conforming rating multiple on the non-conforming loans in the portfolio, after the application of regional concentration adjustments described below.

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 contains a significant buffer relative to the long-term average historical performance. For a given country, Fitch expects the representative pool 'AAAsf' to remain constant through normal economic cycles.

Regional Concentrations

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

There are two types of regional concentration tests:

1. Regional concentration test: 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 (for example, Region 1 Population = 10.0%) multiplied by a defined threshold (for instance, 2.5x). The regional concentration test is applicable for all countries. For each country, the regions, assumed population and threshold are specified in the country-specific assumption sheet.
2. Australia Bureau of Statistics (ABS) regional concentration test (Australia only): An ABS regional concentration is deemed to exist if the portion of properties within a given ABS region, defined as Statistical Area Level 4 by the ABS, based on property count exceeds the threshold; for instance ABS regional threshold = 5.0%.

If a regional concentration (for instance, Region 1 Property Count = 35.0%) or an ABS regional concentration (for instance, ABS Region 2 Property Count = 7.5%) is deemed to exist, the FF rating multiple applied to the portfolio will be derived as the WA of the standard multiples – that is, without regional concentration – and the relevant regional or ABS regional concentration multiples, as specified in country-specific assumption sheets.

The regional and ABS regional concentration multiples will have a weighting equal to the percentage of the portfolio property count that exceeds the respective regional population threshold; for example, regional concentration: 35.0% - 10.0% x 2.5 = 10.0% and ABS regional concentration: 7.5% - 5.0% = 2.5%. If both types of regional concentrations exist, the applicable multiple will be derived by taking a ratio of the product of both WA multiples to the standard multiple.

Manual Pool Adjustments

The asset model includes the functionality to apply manual WAFF adjustments to a user-defined percentage of the pool of a user-defined magnitude. Such adjustments are applied only in the event that the data review identifies the need for Data Adjustments that cannot be applied to individual loans. Portfolio-level adjustments do not affect the WAFF for loans that are subject to an 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 country-specific assumption sheet; however, such loans cannot be identified within the loan-level data.

Performance Adjustment

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

Fitch compares the projected default rate (as derived below) with the total portfolio expected-case WAFF (calculated without a performance adjustment). The purpose is to adjust the

criteria-derived transaction-specific WAFF to take into account the observed performance, where the reported performance is considered to be indicative of future performance.

Derivation of Projected Default Rate

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 the asset model using country-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 will be applied to the performing pool WAFF (without performance adjustment); it will not be applied to the arrears pool WAFF.

- 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.
- An increased floor (for example, 100%) will be applied 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; (iii) a material deterioration in reported performance is expected based on recent trends or the country macroeconomic outlook; or (iv) the portfolio has a significant back-loaded risk profile, such as a large percentage of high loan-to-value interest-only loans.

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 that are not in arrears 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 1.5x.

Fitch will first set 'Bsf' and 'AAAsf' macroeconomic adjustments, and then obtain the other category level adjustments (e.g. AAsf) as described below. The asset model 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 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). 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.

Arrears Floor

The FF assumption for loans with an arrears status (DT54) is subject to a floor intended to address the elevated FF risk of such loans. The applicable loan-level FF floor is specified in the relevant country-specific assumption sheet and depends on the rating category.

An arrears pool WAFF is calculated at each rating category by averaging the loan-level FF in each rating category, after application of the floor, by the current balance (DT8) of loans with a status of arrears.

Portfolio WAFF

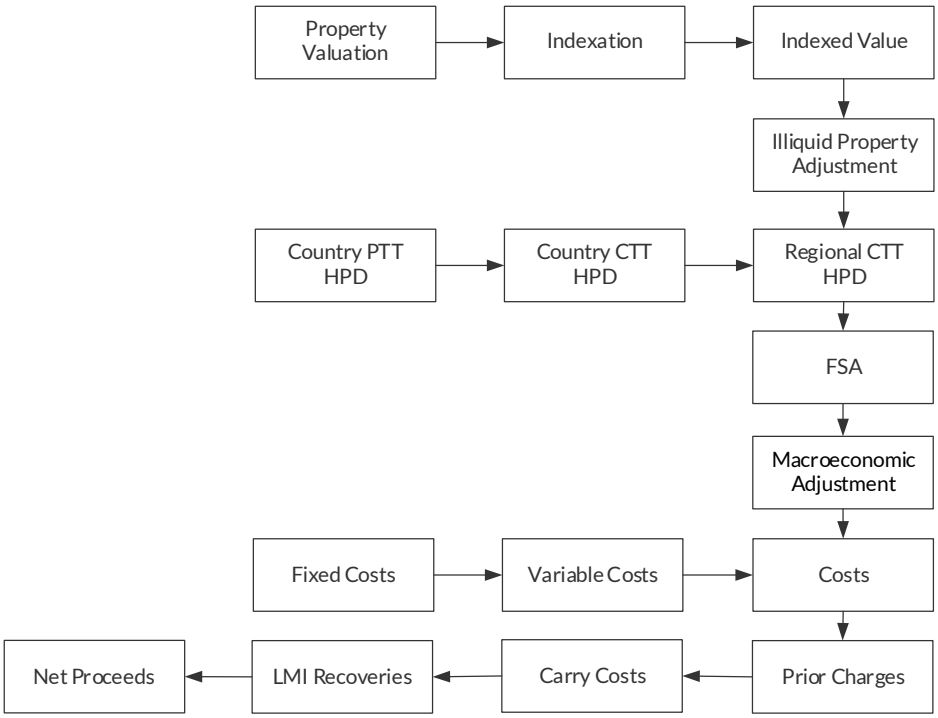
The portfolio WAFF is calculated in the expected case and for each rating category level (Bsf to AAAsf), as the average of the performing pool WAFF and the arrears pool WAFF, weighted by the current balance (DT8). The asset model provides a notch-level portfolio WAFF for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs; for example, 'AA+sf' WAFF is equal to 'AAsf' WAFF plus a third of the difference between 'AAAsf' WAFF and 'AAsf' WAFF. The notch-level WAFFs are input to the multi-asset and covered bond cash flow models for RMBS and covered bonds, respectively. The expected case output of the asset model is used as the base case and 'CCCsf' input to the multi-asset cash flow model and covered bond cash flow model.

Asset Model – Net Proceeds

Fitch's asset model calculates assumed property-level net proceeds for all loans. The net proceeds assumption represents the amount that would be recovered from the property in the event of a default and foreclosure, net of foreclosure costs. The property-level net proceeds amount is used in the asset-model to calculate the borrower-level RR.

The indexed value, along with the HPD and FSA assumptions, are the key drivers of property-level net proceeds. The property-level net proceeds amount is calculated within the asset model 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 as the sum of the unique current valuation amount (DT14, DT21, DT28, DT35 and DT42). The applicable valuation date for the property will be equal to the property valuation date (DT17, DT24, DT31, DT38 and DT45) or, if not provided, the loan origination date (DT6).

Where there is more than one property per loan, the applicable property type, region, valuation date assumed for the loan will correspond to the property with the largest valuation amount. If the largest applicable valuation amount is the same across multiple properties for the one loan, the information will be taken from the property with the latest valuation date, otherwise, the first property listed with a property ID. In the event that the same property ID (DT13, DT20, DT27, DT34 and DT41) contains different valuation dates or any other corresponding property-related information, the entry relating to the property ID with the latest valuation date will be used.

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 (HPI) observation within the model. Indexation is applied according to country-specific regional HPI shown in the country-specific assumption sheet.

Individual properties are mapped to regions using the location field (DT15, DT22, DT29, DT36 and DT43). If there are multiple properties securing one loan, property price indexation is calculated using the rules outlined in the section Property Valuation and applied to the total security value of the loan.

Illiquid Property Adjustment

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

The illiquid property adjustment threshold amounts are calibrated such that approximately 2.5% of properties will exceed such security value thresholds. The illiquid property adjustment thresholds are specified in the country-specific assumption sheet and applied to the property value after the application of indexation. If there are multiple properties securing one loan, the illiquid property adjustment will be assessed against the security with the largest unindexed security value, as selected using the rules outlined in the section Property Valuation.

House Price Decline

HPD assumptions vary by rating scenario and reflect the potential impact of differing degrees of economic stress upon house prices. HPD assumptions are key inputs to Fitch's criteria; the 'Bsf' and 'AAAsf' peak-to-trough (PTT) assumptions are shown in the key country-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. In this usage, 'current' refers to the most recent observation contained in the applicable country-specific HPI, as shown in the country-specific assumption sheet.

Country PTT HPD

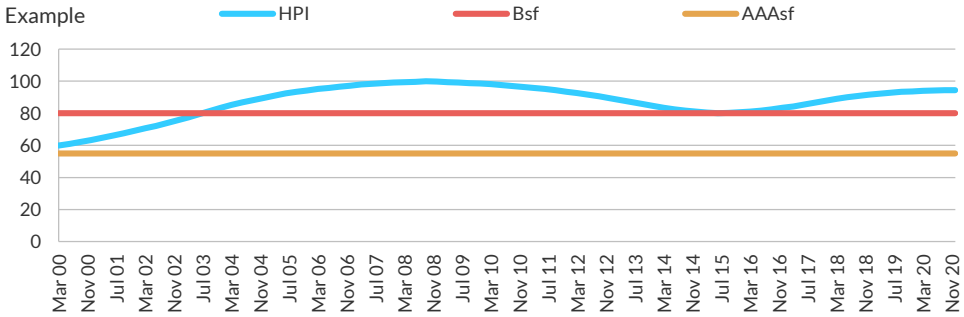
Country PTT HPD assumptions are calibrated taking into account an analysis of historical data and forward-looking expectations. In the first step, Fitch defines country-specific PTT stresses. The 'Bsf' PTT HPD assumption captures Fitch's forward-looking views, as well as a limited margin of safety. The '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 (PTC) HPI movement as shown below the chart. In the chart, 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% in a 'Bsf' stress and 55% in a 'AAAsf' scenario.

House Price Decline Assumptions



Source: Fitch Ratings

As at December 2016, the HPI was 90%, assuming that December 2016 represents the 'current' value, as defined above, and the PTC decrease has been 10%.

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

CTT = 1 – (1 – PTT) / (1 –PTC)

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 the performance of regions may vary in a downturn.

HPD Update Process

Fitch updates HPI values, illiquid property thresholds and CTT HPD assumptions annually for Australia and New Zealand and when the asset model is required to be run for Japan (but not more frequently than quarterly), subject to the availability of updated HPIs. For Australia and New Zealand, more frequent updates will be performed if the country HPI indicates an increase or decrease of house prices by more than 15% compared with the last indexation. Illiquid property threshold amounts are also updated to take into account HPI movements.

For Japan, CTT HPD assumptions are updated to reflect the latest PTC observation by applying the above calculations.

For Australia and New Zealand, regional CTT HPD assumptions are updated to reflect the latest regional PTC observation utilising regional HPI levels directly, removing the need to apply a regional scaling factor for HPD updates. If future HPI levels (country level for Japan and regional level for Australia and New Zealand) exceed the peak levels observed when setting the PTT HPD assumptions, the peak observed when setting the PTT HPD assumptions (reference peak) will continue to be referenced when calculating CTT HPD assumptions for the purpose of the updates. In addition, Fitch reviews criteria assumptions annually; where property values exceed historical peaks, Fitch will redefine the reference peak and may redefine PTT HPD assumptions.

The country-specific assumption sheet is updated to reflect any changes to HPI values, MVD and illiquid property threshold assumptions.

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-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 the indexation of the original valuation.

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

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

Climate-Related Policy Adjustments

Climate-change mitigation policies affecting residential properties are usually expected to relate to emission levels and the general physical climate resilience attributes of the buildings, such as insulation, heating and lighting, which are typically measured via an energy performance certificate or minimum energy standards applicable to a building at the time of construction and/or renovation.

To the extent that data relating to the value of properties based on their relative energy performance or to their construction year is available, Fitch may adjust the country or originator-specific FSA. Such adjustment will reflect the positive and/or negative effect of a property's energy performance on sale proceeds, relative to general market expectations.

Fitch will provide a public disclosure detailing any adjustment to the FSA as specified under this criteria in its Rating Action Commentaries, together with how these were considered in the rating decision. Such adjustments would be considered as a variation to criteria.

Market Value Decline

MVD represents the total property decline stress applied for each rating category, inclusive of the House Price Decline and FSA, but excluding the Illiquid Property Adjustment. The MVD for each geographic region and rating stress category is detailed in the relevant country-specific assumptions sheet. In the asset model, the MVD 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. The MVD is calculated as follows.

MVD = 1- [(1 – FSA) x (1 – HPD)]

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 MVD 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 MVD assumptions.

Fitch will first set 'Bsf' and 'AAAsf' macroeconomic adjustments, and then obtain the other category level adjustments (e.g. AAsf) as described below. The asset model 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' MVD and the 'Bsf' MVD as defined above. The stressed 'Bsf' MVD will be derived similarly to the 'Bsf' MVD 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. The FSA is then applied to determine the stressed MVD.

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' MVD 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 the stressed MVD at 'Bsf' and at 'AAAsf'. The stressed MVD at the other rating-category levels will be obtained by an interpolation aimed at maintaining the progressivity of other criteria assumptions (e.g. regional MVD without macroeconomic adjustment). The other rating-category macroeconomic adjustments (e.g. AAsf) will be obtained as the difference between the stressed MVD and the MVD (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 MVD without macroeconomic adjustments and the stressed MVD. This format will be used as input into the asset model.

Foreclosure Costs

The property-level recovery proceeds are further reduced to take into account assumed foreclosure costs. The foreclosure costs are applied on a fixed and variable basis. Fixed costs are applied on a per property basis. 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 foreclosure costs are defined on a country-specific basis and are specified in the country-specific assumption sheet.

Prior Charges

The loan-level recovery proceeds are further reduced to take into account the balance of any prior charge amount (DT12).

Borrowers With Multiple Loan Accounts

For borrowers who have multiple loan accounts, the borrower's aggregated property-level recovery proceeds after the application of foreclosure costs and prior charges (floored at zero) are proportionally allocated to each loan account based on the scheduled balance (DT10) including any prior charges.

Carry Costs

For Australia and New Zealand, the property-level recovery proceeds are further reduced to take into account assumed carry costs. For mixed pools of conforming and non-conforming loans, Fitch applies the conforming carry costs to the conforming loans and the non-conforming carry costs to the non-conforming loans in a portfolio. This is done by applying a stressed interest rate for carry costs for the duration of the carry cost timing, as disclosed in the country-specific assumption sheet.

Lenders' Mortgage Insurance Recoveries

Where LMI cover is present on a loan account for a borrower, recoveries from the LMI provider linked to that loan account are applied to recoveries allocated to that loan account in accordance with the *RMBS Lenders' Mortgage Insurance Rating Criteria*. LMI recoveries are not applied to prior charges. The LMI provider insuring the loan, if present, is mapped to LMI provider (DT48), while the quality adjustment (QA) linked to the originator is mapped to issuer for LMI QA (DT49).

Asset Model: Recovery Rate

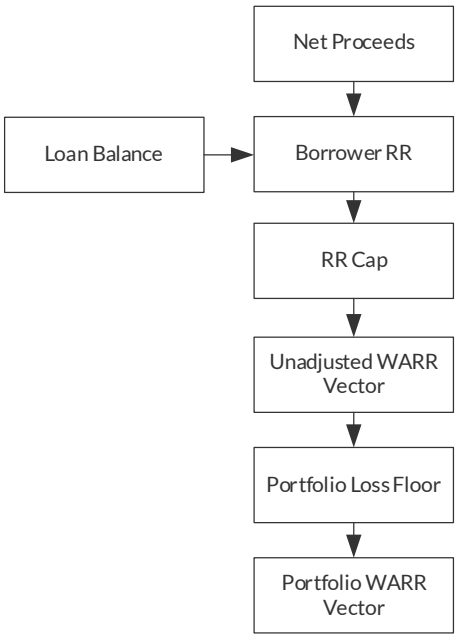
The asset model uses the property-level net proceeds calculation to calculate borrower-level recovery rate and portfolio-level RR assumptions.

The portfolio-level RR assumptions are input to the multi-asset and covered bond cash flow models for RMBS and covered bonds, respectively.

The borrower-level RR essentially represents the aggregated property-level net principal proceeds divided by the borrower's loan balance. RR assumptions are calculated for each year of the amortisation period (between year one and year 30 from the portfolio cut-off date). The purpose of the RR vector is to take into account the difference in RRs, according to the time of the default, driven by expected amortisation of the loan balance.

The borrower- and portfolio-level RR is calculated within the asset model for each rating category scenario by applying the sequence below.

Asset Model – RR Diagram



Source: Fitch Ratings

Borrower-Level RR

The asset model calculates borrower-level RRs 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 RRs are calculated for each year as the greater of (i) the sum of expected principal recovery amounts divided by the assumed balance of loans and (ii) zero. Recovery amounts for each borrower take into account the sum of linked property-level net proceeds.

Loan Balance

The loan balance is calculated at the loan and borrower-level. The borrower-level loan balance is used as the denominator in the calculation of the borrower-level RR. In year one of the asset model output, the loan-level loan balance is calculated as the higher of the current balance (DT8) and the scheduled balance (DT10).

Thereafter the loan-level 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 on the basis of a constant amortisation profile for all loans.

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

RR Cap

The borrower-level RR is limited to an amount of 100% less carry costs for Australia and New Zealand and 100% for Japan.

Unadjusted WARR Vector

Within the asset model, the unadjusted weighted-average recovery rate (WARR) vector is produced by the aggregation of the borrower level RR for each year of the amortisation period (between year one and year 30 from the cut-off date) and in each rating scenario category between the expected case and 'AAAsf'. The asset model provides a notch-level unadjusted WARR for notches from the expected case to 'AAAsf' by interpolating between category level outputs.

Portfolio Loss Floor

The asset model applies a portfolio loss floor to each portfolio. For mixed pools of conforming and non-conforming loans, the asset model will apply a WA portfolio loss floor based on the proportion of conforming and non-conforming loans in the portfolio. The portfolio loss floor is intended to ensure sufficient CE 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 will be reduced in the case of portfolios supported by LMI.

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 annualising the middle-loaded default distribution assumption shown in the foreclosure section of this report.

Country-specific portfolio loss floors at the 'AAAsf' level are specified in the country-specific assumption sheets; for example, 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 without the benefit of LMI is implemented within the asset model via the following calculations:

- The floored loss at each rating category-level (for instance, AAAsf) is equal to the higher of the unadjusted loss without the benefit of LMI and the category portfolio loss floor calculated with the scaling factor as outlined above.
- The floored loss without the benefit of LMI at each rating notch-level (for instance, AA+sf) is calculated as the notch-specific WAFF x (1-notch-specific floored WARR without the benefit of LMI).
- The floored WARR without the benefit of LMI at each rating category-level is calculated as 1 less (category-specific floored loss without the benefit of LMI/category-specific WAFF), and floored at 0%.
- The floored WARR without the benefit of LMI at each rating notch-level is interpolated from the floored WARR without the benefit of LMI at each rating category level. Whereby, for example, 'AA+sf' is equal to the 'AAsf' floored WARR minus a third of the difference between 'AAsf' floored WARR and 'AAAsf' floored WARR.

The portfolio loss floor with the benefit of LMI is implemented within the asset model via the following calculations:

- The floored loss with the benefit of LMI at each rating category level (for instance, AAAsf) is equal to the category floored loss without the benefit of LMI as outlined above x unadjusted loss with the benefit of LMI/unadjusted loss without the benefit of LMI.
- The floored loss with the benefit of LMI at each rating notch-level (for instance, AA+sf) is calculated as the notch-specific WAFF x (1-notch-specific floored WARR with the benefit of LMI).
- The floored WARR with the benefit of LMI at each rating category-level is calculated as 1 less (category-specific floored loss with the benefit of LMI/category-specific WAFF), and floored at 0%.

- The floored WARR with the benefit of LMI at each rating notch-level is interpolated from the floored WARR with the benefit of LMI at each rating category level. Whereby, for example, 'AA+sf' is equal to the 'AAsf' floored WARR with the benefit of LMI minus a third of the difference between 'AAsf' floored WARR with the benefit of LMI and 'AAAsf' floored WARR with the benefit of LMI.

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. The asset model provides notch-level portfolio WARR vectors for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs. The expected case output of the asset model is used as the base case and 'CCCsf' input to the Multi-Asset Cash Flow Model and covered bond cash flow model.

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

Multi-Asset Cash Flow Model

Overview

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

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 transaction cash flows are tested in multiple stress scenarios from the initial cut-off date (initial rating cash flow model projections) 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, based on a review of the transaction documentation, 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. Fitch will model key structural features, which may affect the final rating levels.

When conducting cash flow analysis, Fitch's 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. 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. 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 realised in a manner consistent with Fitch's published default distribution curve.

Model-Implied Rating

The MIR produced by the Multi-Asset Cash Flow Model is defined as the highest rating level at 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 (that is, CCCsf) as well as notch-specific rating scenarios from 'B-sf' to 'AAAsf'.

Where the Multi-Asset Cash Flow Model is run, the MIR for the purpose of the rating determination is the lower of the MIR produced by the Multi-Asset Cash Flow Model and the rating resulting from any applicable concentration tests (Revolving Pool Concentration Test or Large Obligor-Concentration Test). Where only the asset model is run, the MIR for the purpose of the rating determination is the highest-rated Portfolio Loss Floor generated by the asset model that is equal to or below the note subordination where all applicable concentration tests are met.

Amortisation Profile

The asset model outputs a scheduled monthly amortisation profile for the portfolio in respect of the loan balance (the higher of the scheduled and current balance) of all loans at the cut-off date. Constant monthly amortisation is assumed in relation to loans.

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.

Prepayment Rates

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 constant prepayment rate is applied to the balance of performing receivables. Where the actual issuer prepayment rate is higher than the 'AAAsf' 'High' assumption, Fitch will still apply the prepayment assumptions shown below if we believe that the prepayment rate will reduce below the 'AAAsf' 'High' assumption through the transaction's life.

Annual Prepayment Rate

Conforming Portfolios

	Australia/New Zealand		Japan	
Rating scenario	High (%)	Low (%)	High (%)	Low (%)
AAAsf	28.0	8.0	18.0	4.0
AA+sf	27.1	8.0	16.7	4.0
AAsf	26.7	8.0	16.0	4.0
AA-sf	26.2	8.0	15.3	4.0
A+sf	25.8	8.0	14.7	4.0
Asf	25.3	8.0	14.0	4.0
A-sf	24.8	8.0	13.3	4.0
BBB+sf	24.4	8.0	12.7	4.0
BBBsf	24.0	8.0	12.0	4.0
BBB-sf	24.0	8.0	12.0	4.0
BB+sf	24.0	8.0	12.0	4.0
BBsf	24.0	8.0	12.0	4.0
BB-sf	24.0	8.0	12.0	4.0
B+sf	24.0	8.0	12.0	4.0
Bsf	24.0	8.0	12.0	4.0
B-sf	24.0	8.0	12.0	4.0
CCCsf	24.0	8.0	12.0	4.0

Source: Fitch Ratings

Non-Conforming Portfolios

	Australia/New Zealand	
Rating scenario	High (%)	Low (%)
AAAsf	32.0	10.0
AA+sf	31.1	10.0
AAsf	30.7	10.0
AA-sf	30.2	10.0
A+sf	29.8	10.0
Asf	29.3	10.0
A-sf	28.9	10.0
BBB+sf	28.4	10.0
BBBsf	28.0	10.0
BBB-sf	28.0	10.0
BB+sf	28.0	10.0
BBsf	28.0	10.0
BB-sf	28.0	10.0
B+sf	28.0	10.0
Bsf	28.0	10.0

Non-Conforming Portfolios

	Australia/New Zealand	
Rating scenario	High (%)	Low (%)
B-sf	28.0	10.0
CCCsf	28.0	10.0

Source: Fitch Ratings

For mixed pools of conforming and non-conforming loans, the non-conforming annual prepayment rate will be applied to all loans in the portfolio where the majority (50% or more by balance, and by using Fitch's non-conforming classification) of the pool is classified as non-conforming; otherwise, the conforming annual prepayment rate will be used.

Foreclosures

The asset model 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 specified 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 defaulted to assess the effects of structural features triggered by an increasing volume of defaulted/arrears assets (for instance, pro rata triggers based on defaults/arrears, and cumulative default triggers).

The values in the default distribution assumptions 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.

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 default distributions as needed so that all defaults are allocated by proportionally front-loading the distributions.

Default Distribution

Australia and New Zealand

Month from cut-off date	Front-loaded (%)	Middle-loaded (%)	Back-loaded (%)
1 - 6	20.0	20.0	2.5
7 - 12	20.0	10.0	2.5
13 - 18	15.0	10.0	5.0
19 - 24	15.0	7.5	5.0
25 - 30	15.0	7.5	5.0
31 - 36	10.0	7.5	5.0
37 - 42	5.0	7.5	10.0
43 - 48		5.0	10.0
49 - 54		5.0	10.0
55 - 60		5.0	10.0
61 - 66		5.0	10.0
67 - 72		5.0	10.0
73 - 78		5.0	5.0
79 - 84			5.0
85 - 90			5.0

Source: Fitch Ratings

Japan

Month from cut-off date	Front-loaded (%)	Middle-loaded (%)	Back-loaded (%)
1-12	20.0	20.0	2.5
13-24	20.0	10.0	2.5
25-36	15.0	10.0	5.0
37-48	15.0	7.5	5.0
49-60	15.0	7.5	5.0
61-72	10.0	7.5	5.0
73-84	5.0	7.5	10.0
85-96		5.0	10.0
97-108		5.0	10.0
109-120		5.0	10.0
121-132		5.0	10.0
133-144		5.0	10.0
145-156		5.0	5.0
157-168			5.0
169-180			5.0

Source: Fitch Ratings

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.

Carry cost timing is used in the asset model, while foreclosure timing assumptions are used in the Multi-Asset Cash Flow Model. The carry cost timing assumptions are shown in the country-specific assumption sheet. The foreclosure timing assumptions are disclosed below and are input to the Multi-Asset Cash Flow Model by rating category without interpolation.

Foreclosure Timing Assumptions

Rating scenario	Australia/New Zealand (months)	Japan (months)
AAAsf	21	22
AAsf	19	18
Asf	18	17
BBBsf	17	16
BBsf	16	15
Bsf	15	14
CCCsf	15	14

Source: Fitch Ratings

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 any 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 loan margin. The cash flow model is input with the average margin scheduled 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 cash flow model is input with the average fixed rate scheduled for each bucket. Where the fixed rates are scheduled to change over time, the rates will 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 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. In Australia and New Zealand, Fitch does not model yield compression where a threshold rate mechanism exists within a transaction and therefore also does not input floating rates on a bucketed basis. Yield compression is not modelled as described in this section for covered bond programmes, please refer to Covered Bond Asset Margins for further details.

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 cash flow model (that is, the note balance that will result from the application of cash collections received up to the portfolio cut-off date). In addition, the Multi-Asset Cash Flow Model will be input with the note coupon amounts as per the transaction documentation.

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 cash flow model (that is, the cash balance that will result from the application of cash collections received up to the portfolio 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 model inputs take into account the effect of distributing such funds by assuming funds are received evenly across a collection period, unless advised

otherwise. Interest earned on collections will be calculated in line with the actual or assumed collection pattern.

For Australia and New Zealand, the Multi-Asset Cash Flow Model takes into account interest earned on the cash reserve account at 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 on the priority of payments and target reserve amounts.

For Japan, Fitch assumes no interest is earned on the cash reserve account.

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 cash flow model reflects the net economic position.

Swap termination payments are not taken into account in the 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 other than the testing for the potential impact of any unhedged exposure due to negative interest rates; rather, the model tests the ability of the issuer to meet interest and principal payments due to the hedging 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 as well as available interest and available principal funds. The priority of payments will be combined or separate as per the transaction documents. The sequence of key items will be reflected in the model. The Multi-Asset Cash Flow Model differentiates between sequential and pro rata amortisation.

Servicing Costs

Annual servicing cost assumptions are shown below for Australia, Japan and New Zealand. They are applied to the beginning of period balance of performing, arrears and defaulted loans. Where transaction documentation specifies a higher rate, Fitch will use the documented rate.

Rating scenario	Servicing costs (%)
AAAsf	0.45
AA+sf	0.42
AAsf	0.40
AA-sf	0.38
A+sf	0.37
Asf	0.35
A-sf	0.33
BBB+sf	0.32
BBBsf	0.30
BBB-sf	0.30
BB+sf	0.30
BBsf	0.30
BB-sf	0.30
B+sf	0.30
Bsf	0.30
B-sf	0.30
CCCsf	0.30

Source: Fitch Ratings

Australia and New Zealand have a minimum servicing cost floor of 50,000 dollars for conforming transactions and 75,000 dollars for non-conforming transactions in their respective currencies. Japan has a minimum servicing cost floor of JPY3.5 million.

For mixed pools of conforming and non-conforming loans, the non-conforming minimum dollar servicing cost floor will be applied where the majority (50% or more by balance, and by using Fitch's non-conforming classification) of the pool is classified as non-conforming; otherwise, the conforming minimum dollar servicing cost floor will be used.

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-Specific Assumptions

Key country-level assumptions are shown below. These assumptions are key inputs to the calibration of the detailed country-specific assumptions and reflect Fitch's overall assessment of the standard mortgage portfolios within the respective countries.

As described in this criteria report, Fitch tailors its country-level asset assumptions to reflect the loan level attributes of each mortgage portfolio. The full set of country-specific assumptions applied in the asset model is shown in the country-specific assumption sheets that can be extracted from the asset model.

Where country-specific analysis is supplemented with further assumptions, these are set out below.

Australia

Key Assumptions: Australia

FF: Conforming	
Representative pool WAFF – 'Bsf' (%)	1.5
FF multiple – 'AAAsf' (x)	7.0
Representative pool WAFF – 'AAAsf' (%)	10.5
FF: Non-conforming	
Representative pool WAFF – 'Bsf' (%)	12.0
FF multiple – 'AAAsf' (x)	3.0
Representative pool WAFF – 'AAAsf' (%)	35.8
RR	
Reference peak	March 2022
PTT assumption – 'Bsf' (%)	12.0
PTT assumption – 'AAAsf' (%)	40.0
FSA (%)	25.0

Source: Fitch Ratings

Large Obligor-Concentration Test

Fitch tests all rated tranches for borrower concentration risk. This test considers Fitch's calculated 'AAAsf' expected loss, calculated as 1 - RR in the first year at the borrower level, for all borrower exposures and assesses the largest borrower exposures relative to the transaction's capital structure when pro rata paydown ceases, generally at the clean-up call date. Fitch will consider the impact concentrations may have on CE levels and the potential impact a large obligor loan default may have on the RMBS structure at the time pro rata paydown ceases.

The following test is extrapolated for each rating notch and tested for each rating scenario:

Proposed Rating	Concentration test Australian dollar minimum subordination at proposed rating level based on 'AAAsf' losses
AAAsf	Largest 5 'AAAsf' pre LMI losses
AAsf	Largest 4 'AAAsf' pre LMI losses
Asf	Largest 3 'AAAsf' pre LMI losses
BBBsf	Largest 2 'AAAsf' pre LMI losses
BBsf	Largest 1 'AAAsf' pre LMI losses
Bsf	0.5 x largest 'AAAsf' pre LMI losses
Expected case	0

Source: Fitch Ratings

For new ratings and surveillance, Fitch may assign a rating higher than the rating at which the transaction passes the large obligor test if there are mitigating factors, without exceeding the MIR produced by the Multi Asset Cash Flow Model. An example is if there is a minor fail in the large obligor concentration test, but when the scheduled amortisation of the loans is applied up to the scheduled end of the pro rata period (rather than as of the pool cut-off date), the note passes the adjusted large obligor concentration test. Alternatively, if a loan is in late stage arrears and the foreclosure process is expected to be concluded prior to the scheduled end of the pro rata period, Fitch will manually exclude this loan from the calculation of the large obligor test.

The tests are conducted at the time of new ratings and in the ongoing surveillance analysis where the asset model is run.

Rating Junior Notes with 100% LMI Cover (Surveillance Only)

For existing rated notes with no CE other than LMI and excess income in Australia, Fitch takes into account the transaction's historical performance, loan seasoning, remaining transaction size, availability of excess income, the sponsor's rating and its history of calling previous transactions.

Fitch uses the following criteria to determine the non-MIR cap of junior notes with no CE other than LMI and excess income instead of using asset and cash-flow analysis.

Proposed Rating	Criteria
BBsf	The transaction is performing well, with low arrears, low losses and deleveraging, with at least five years of seasoning. In addition, LMI continues to pay a significant portion of submitted claims or the sponsor has covered, and is expected to cover, LMI reductions and denials due to breaches of representations and warranties. ExS in dollar amounts is considered to be sufficient to cover principal shortfalls from LMI reductions and denials at call.
Bsf	The transaction is performing well, with low arrears, low losses and deleveraging, with at least five years of seasoning. In addition, LMI continues to pay a significant portion of submitted claims or the sponsor has covered, and is expected to cover, LMI reductions and denials due to breaches of representations and warranties. Default risk is present, but a limited margin of safety remains. Fitch reviews ExS to see if it will be sufficient to cover principal shortfalls and for the notes to be fully repaid. However, the notes are exposed to deterioration in the economic environment.
CCCsf	A possibility of the notes defaulting exists where Fitch does not expect the sponsor to call the transaction, losses are above expectations and the LMI payment ratio has significantly decreased, leading to a reduction in ExS and increasing consequential losses.

Source: Fitch Ratings

Threshold Margin

Many Australian and New Zealand RMBS transactions require the servicer to maintain a specified level of earnings within the rated trust to meet the threshold rate, typically defined as the WA asset rate sufficient to meet all, or all required transaction and liability costs, under the transaction documentation. This requirement is effective either from transaction close or on termination of the basis swap (if present). Where asset performance deteriorates, it increases the burden on the remaining performing assets to meet the threshold rate. If interest rates are increased excessively, it may result in additional asset deterioration. Where the threshold margin feature is present in a deal, Fitch will cash flow model the transaction with a maximum increase to asset margins of 2.0% to meet the required payment obligations of the transaction, as defined in the transaction documentation.

Fitch will apply a threshold margin below 2.0% where the WA mortgage rate of a portfolio is considered above the market standard and disclose the applied threshold margin in transaction specific reporting. If analysis for an individual transaction utilises a threshold margin above this maximum, this will be treated as per the Variations from Criteria.

Non-Conforming Loan Classification

Fitch evaluates a number of attributes when assessing whether a loan product is classified as non-conforming, including, but not limited to:

- the lender's own classification of the loan product;
- loan products that are available to borrowers who have had a previous financial default greater than AUD1,000 or equivalent;
- loan products that are available to borrowers who have had a prior bankruptcy;
- loan products where the serviceability assessment performed is not consistent with market standards for conforming loans;
- loan products where the historical performance is materially worse than Fitch's conforming Dinkum index.

For the avoidance of doubt, any loans where the borrower has had a prior bankruptcy will be classified as non-conforming.

Covered Bond Asset Margins

Basis and fixed-floating swaps, or total return swaps are in place on the cover pools, all of which are provided by the issuing bank. The basis swaps used on the floating-rate mortgage assets are considered esoteric and not replaceable. We instead rely on the equivalent asset margin over benchmark rates based on the floating-rate mortgage yield, in our cash flow analysis. For the fixed-rate mortgage assets, we use the fixed-rate swap margin as notified by the issuer.

Japan

Key Assumptions: Japan

FF	
Representative pool WAFF – 'Bsf' (%)	2.4
FF multiple – 'AAAsf' (x)	6.8
Representative pool WAFF – 'AAAsf' (%)	16.3

RR	
Reference peak	March 2019
PTT assumption – 'Bsf' (%)	15.0
PTT assumption – 'AAAsf' (%)	40.0
FSA (%)	23.0

Source: Fitch Ratings

Japan Criteria Scope

The criteria assumptions for Japan will be used for the analysis of prime mortgage loans in new and existing RMBS and well-seasoned (10 years+) non-conforming mortgage loans in existing RMBS with a stable asset performance record.

The other criteria scopes for Japan are summarised below:

- The underlying portfolio only incorporates a marginal portion (not more than 1% at closing) of borrowers with past delinquent history.
- The purpose of the mortgage loan is for home purchase or refinancing without cash out or debt consolidation.
- Loans with an LVR that is above 100% do not significantly surpass a 100% LVR at closing (for instance, 110%).
- The borrowers of the mortgage loans are Japanese and non-Japanese permanent residents in Japan.

Non-Conforming Loan Classification

Non-conforming loans are defined as loans that do not conform to bank lending criteria. These may include loans to borrowers who have a poor credit history recorded in credit bureaus or have previously declared bankruptcy.

Recovery from Properties Where Mortgage Guarantors Retain Security Rights

Japanese mortgage loans are typically guaranteed by a subsidiary of the loan originator or a third-party guarantor. If mortgage loans are originated by a bank, those loans are typically guaranteed by the bank's wholly owned subsidiary that holds mortgages to secure its right to claim reimbursement from borrowers.

In RMBS transactions, while the loans and the lender's guarantee claims against the guarantor are transferred to a trustee for securitisation at closing, mortgages are typically not transferred to the trustee from the guarantor and continue to be held by the guarantor as the holder of secured claims (i.e. reimbursement claims against borrowers). In case of the guarantor's bankruptcy, the lender (trustee) would not be able to exercise mortgage on defaulted loans unless the guarantor's insolvency trustee takes steps to allow the trustee to exercise the mortgage (e.g. transfer thereof to the trustee), as the trustee does not own any direct rights on the obligors' properties.

If the trustee does not hold mortgages at closing, Fitch will conservatively impose additional stresses on recovery from properties as follows.

(1). If there are no structural mitigants, Fitch assumes zero recovery from properties.

(2). If an effective downgrade trigger is incorporated in the transaction documents, where the guarantor will establish a mortgage on mortgage upon loss of its investment-grade rating or rating withdrawal,

   a. Fitch will extend its assumed foreclosure period by six months as a negotiation period with the bankruptcy trustee to liquidate the properties;

   b. Fitch will manually reduce the stressed property value by a further 10% to consider additional costs that may be required to liquidate properties if the guarantor were in the bankruptcy proceedings; and

   c. Fitch expects the costs for the structural mitigants, such as expenses and fees, to establish the mortgage on mortgage to be reserved in the trust at closing.

Fitch will disclose in our rating communications if the trustee does not hold mortgages at closing, the available structural mitigants and the approach applied by Fitch.

New Zealand

Key Assumptions: New Zealand

FF: Conforming	
Representative pool WAFF – 'Bsf' (%)	1.7
FF multiple – 'AAAsf' (x)	7.0
Representative pool WAFF – 'AAAsf' (%)	11.6

FF: Non-conforming	
Representative pool WAFF – 'Bsf' (%)	13.2
FF multiple – 'AAAsf' (x)	3.0
Representative pool WAFF – 'AAAsf' (%)	39.4

Recovery rate	
Reference peak	December 2021
PTT assumption – 'Bsf' (%)	15.0
PTT assumption – 'AAAsf' (%)	40.0
FSA (%)	25.0

Source: Fitch Ratings

Country Uplift

The New Zealand representative pool WAFF above, and the base FF matrix disclosed in the New Zealand assumption sheet, include a 10% increase to FF above the corresponding Australian levels. This country uplift addresses the small size of New Zealand's market relative to the Australian RMBS market.

The Large Obligor-Concentration Test, Threshold Margin, Non-Conforming Loan Classification and Covered Bond Asset Margins apply in full to New Zealand transactions.

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 understand 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 are disclosed in the respective rating action commentaries, including their impact on the ratings, 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.

Limitations

Ratings assigned by Fitch, including Watches and Outlooks, are subject to the limitations specified in Fitch's rating definitions; see fitchratings.com/products/rating-definitions

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

Criteria Disclosures

Fitch will disclose the following items in transaction-specific reporting:

- Application of (and any amendments to) macroeconomic adjustments, including the level of the adjustments.
- Portfolio-specific default distributions that differ from criteria.
- Originator adjustments, if not 1.0x.
- Rating assumption sensitivity analysis results (for new ratings only).
- Threshold margin if not 2.0%.
- For mixed portfolios, the percentage of non-conforming and conforming loans using Fitch's classification.
- For Japanese transactions, where the trustee does not hold mortgages at closing, the available structural mitigants and the approach applied by Fitch.
- Variations from criteria.

Rating Assumption Sensitivity

At the time of assigning initial ratings, Fitch conducts a rating assumption sensitivity in our Multi-Asset Cash Flow Model. This provides an insight around MIR sensitivities to hypothetical changes in WAFF and WARR assumptions. Typical sensitivity scenarios include:

- 15% and 30% increase in FF of the mortgage pool using standard criteria assumptions;
- 15% and 30% decrease in RR of the mortgage pool using standard criteria assumptions; and

- 15% increase in FF and 15% decrease in RR as well as a 30% increase in FF and 30% decrease in RR of the mortgage pool using standard criteria assumptions.

The MIR sensitivities are only indicative of potential outcomes and do not consider other risk factors to which the transactions are exposed. The results shown are for a sample pool, with notes hypothetically rated at the levels shown.

Rating Sensitivity to Increase in Default Rates

Original Rating	15% increase	30% increase
AAAsf	AA+sf	AAsf
AAsf	AA-sf	A+sf
Asf	A-sf	BBBsf
BBBsf	BBBsf	BBB-sf
BBsf	BB-sf	B+sf
Bsf	<Bsf	<Bsf

Source: Fitch Ratings

Rating Sensitivity to Decrease in RR

Original Rating	15% decrease	30% decrease
AAAsf	AA+sf	AA-sf
AAsf	A+sf	Asf
Asf	BBB+sf	BBB-sf
BBBsf	BBBsf	BB+sf
BBsf	BB-sf	Bsf
Bsf	<Bsf	<Bsf

Source: Fitch Ratings

Rating Sensitivity to Increase in Default Rates and Decrease in RR

Original Rating	15% increase and 15% decrease	30% increase and 30% decrease
AAAsf	AAsf	A+sf
AAsf	Asf	A-sf
Asf	BBBsf	BB+sf
BBBsf	BBB-sf	BBsf
BBsf	B+sf	Bsf
Bsf	<Bsf	<Bsf

Source: Fitch Ratings

When performing rating assumption sensitivities, Fitch modifies the pre-LMI WARR Middle to isolate the effect of a change in recovery proceeds at the borrower level. The analysis, as described above, applies to RMBS transactions only and not to covered bond programmes.

Appendix 1: Data Fields

APAC Fitch RMBS Data Template

Field number	Field name	Country applicability
DT1	Row Number	All
DT2	Pool Cut-off Date	All
DT3	Loan Type	All
DT4	Loan ID	All
DT5	Borrower ID	All
DT6	Loan Origination Date	All
DT7	Loan Maturity Date	All
DT8	Current Balance	All
DT9	CLVR_Override	All
DT10	Scheduled Balance	Australia/New Zealand
DT11	Scheduled LVR_Override	Australia/New Zealand
DT12	Prior Charge Amount	All
DT13	Property 1 ID	All
DT14	Property 1 Value	All
DT15	Location 1	All
DT16	Province 1	Not applicable
DT17	Valuation Date 1	All
DT18	Property Type 1	All
DT19	Property Size (sq m) 1	Not applicable
DT20	Property 2 ID	All
DT21	Property 2 Value	All
DT22	Location 2	All
DT23	Province 2	Not applicable
DT24	Valuation Date 2	All
DT25	Property Type 2	All
DT26	Property Size (sq m) 2	Not applicable
DT27	Property 3 ID	All
DT28	Property 3 Value	All
DT29	Location 3	All
DT30	Province 3	Not applicable
DT31	Valuation Date 3	All
DT32	Property Type 3	All
DT33	Property Size (sq m) 3	Not applicable
DT34	Property 4 ID	All
DT35	Property 4 Value	All
DT36	Location 4	All
DT37	Province 4	Not applicable
DT38	Valuation Date 4	All
DT39	Property Type 4	All

APAC Fitch RMBS Data Template (Cont.)

Field number	Field name	Country applicability
DT40	Property Size (sq m) 4	Not applicable
DT41	Property 5 ID	All
DT42	Property 5 Value	All
DT43	Location 5	All
DT44	Province 5	Not applicable
DT45	Valuation Date 5	All
DT46	Property Type 5	All
DT47	Property Size (sq m) 5	Not applicable
DT48	LMI Provider	Australia/New Zealand
DT49	Issuer for LMI QA	Australia/New Zealand
DT50	Non-Resident	All
DT51	Annual Salary	All
DT52	Loan Purpose	All
DT53	Interest-Only End Date	All
DT54	Arrears Status (days)	All
DT55	Documentation Type	All
DT56	Employment Status	All
DT57	Overdraft Loan	New Zealand
DT58	Interest Rate Type	All
DT59	First-Time Home Buyer	All
DT60	Effective Interest Rate	All
DT61	Fixed-Rate End Date	All
DT62	Prior Defaults	All
DT63	Bankruptcy, Individual Voluntary Arrangement or Equivalent	All
DT64	Staff Loan	All

Source: Fitch Ratings

Appendix 2: Data Sources

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

Representative Pool FF Rates

- Australia, New Zealand and Japan: Historical arrears, annual and cumulative default rates from Fitch-rated RMBS transactions and third-party data providers.
- Macroeconomic data and mortgage market performance from national central banks and national statistical organisations.

Loan-Level FF Adjustments

- Australia and New Zealand: Regression analysis of loan performance versus loan-level attributes sourced from third-party data providers and Fitch's internal databases.
- Japan: Observations of Fitch-rated RMBS in other countries, including Australia and Europe.
- Regional population distributions from the Australian Bureau of Statistics, Stats NZ and other sources.

House Price Indices

- Australia: CoreLogic
- Japan: Ministry of Land, Infrastructure, Transport and Tourism
- New Zealand: CoreLogic

Foreclosed Sale Adjustment

- Historical loan-level data from servicers of Fitch-rated RMBS transactions.
- Housing stock.
- Housing completions.

Illiquid Property Adjustment Thresholds

- Australia and New Zealand: Property values within RMBS transactions as per Fitch's internal databases.
- Japan: Price data of traded residential properties and land by Real Estate Information Network for East Japan.

Foreclosure Timing Assumptions

- Australia, New Zealand and Japan: Observations from servicers of Fitch-rated RMBS.

Cash Flow Model Assumptions

- Historical prepayment rates and default distributions from Fitch-rated RMBS transactions; originator-specific data.
- Servicing cost observations from Fitch-rated and non-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 Counterparty Rating Criteria: Derivative Addendum (August 2022)
Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria (December 2022)
Structured Finance and Covered Bonds Country Risk Rating Criteria (February 2023)
Covered Bonds Rating Criteria (November 2022)
SME Balance Sheet Securitisation Rating Criteria (October 2021)
RMBS Lenders' Mortgage Insurance Rating Criteria (March 2021)

Source: Fitch Ratings

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