

# China Residential Mortgage Rating Criteria

## Sector-Specific

### 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 to individuals in mainland China (excluding Hong Kong).

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 may also be applied to the analysis of covered bonds backed by residential mortgage loans in China. The house price decline (HPD) and foreclosed sale adjustment (FSA) assumptions of these criteria may also be applied to the analysis of SME balance-sheet securitisations backed by residential mortgage loans in China.

### Key Rating Drivers

Chinese 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 data limitation, operational risk or counterparty risk considerations.

**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 by the unindexed current loan-to-value ratio (CLVR), the current debt-to-income (CDTI) ratio, the mortgage portfolio's remaining term at transaction closing and other borrower and loan characteristics; and (ii) RRs, derived from the indexed CLVR, 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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This criteria report updates and replaces *China Residential Mortgage Rating Criteria*, published on 1 June 2022.

### Related Criteria

[See Appendix 3](#)

### Model

[ResiGlobal Model: APAC](#)

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## Criteria Prerequisites

### Criteria Application

These criteria are applicable to portfolios of residential mortgage loans to individuals in China. These criteria assumptions are based on an analysis of historical performance data of securitised and unsecuritised standard mortgage portfolios within China, as well as Fitch's expectations.

In reviewing a new transaction, Fitch may not rate the transaction if the mortgage portfolio contains characteristics that are uncommon in the market. We would consider the product characteristics of the mortgage portfolio, the lending practices of the originator and the availability of originator-specific historical performance data. Fitch expects these conditions:

- Loans that are 30 or more days past due on the pool cut-off date as a share of the securitised portfolio by unpaid principal balance are not more than 5%;
- All the underlying mortgages are first-lien mortgages with a completed mortgage registration;
- All the underlying mortgages are fully amortising loans (i.e. with an equal-principal or equal-installment repayment schedule);
- All the underlying mortgages comply with the regulatory requirements in effect at loan origination;
- The LVR at origination of all the underlying mortgages cannot exceed 80% and the DTI at origination cannot exceed 50%; and
- The average remaining term of the mortgage loans' portfolio weighted by unpaid principal balance at transaction closing, rounded to the nearer integer year, does not exceed 20 years.

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 China country-specific assumptions in this criteria report 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 and proxy data deemed inappropriate, 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 Chinese 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 or Fitch believes a more in-depth analysis of the origination process is necessary. Fitch carries out originator reviews of repeat issuers 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 the operational implementation and consistency of the originator's practices and policies. For repeat issuance, unless Fitch believes a more in-depth analysis of the origination process is necessary, a loan file review may not be undertaken on a transaction-specific basis subject to (i) a third-party assessment report being received, in line with the section [Data Review](#), or (ii) the last loan file review being performed less than 24 months ago.

### **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, 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.

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

- arrears data and default data aggregated at the lender level and by product (where available);
- 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.

### **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. Fitch expects to be provided with data for all applicable 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 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 or trustee'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](http://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.

### **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 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.

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](#) 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, and this rating cap is not factored into the MIR. In this case, the note rating will be the lower of the rating cap and the MIR.
- For new and existing ratings, a Fitch rating committee can consider other quantitative and qualitative factors when assigning the ratings. The final rating considered appropriate by the committee may be one notch above or below the relevant MIR.
- For existing ratings, where updated analysis results in an 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 at or downgraded to 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. This may occur when there is a trend of and we expect increasing credit enhancement on the note.

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<sup>1</sup>.

- For existing ratings, where updated analysis results in an MIR that is greater than the current rating and Fitch expects the MIR to be lower in 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 to any level between the current rating and the MIR if we expect the MIR in future model updates will converge to that level<sup>2</sup>.
- An 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 'Cs' to 'B-sf' by taking into account 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, such as existing credit enhancement and ExS in excess of expected losses.

The [third bullet point](#) above is not applicable when the MIR is lower than 'B-sf'.

### 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).

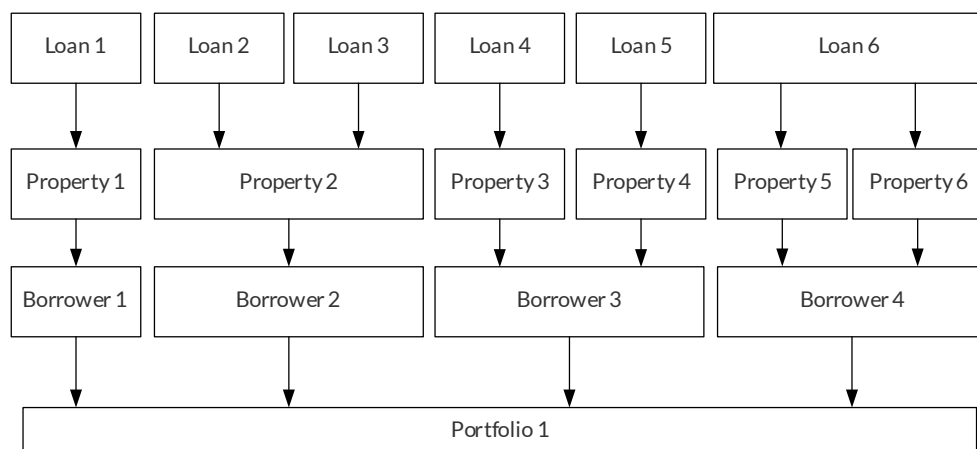
Fitch's asset model performs calculations at loan, property and borrower levels, as described in this report. Property-level calculations are completed utilising unique property IDs at the security level, and aggregated at the loan level and at the borrower level. Borrower-level calculations aggregate 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.

<sup>1</sup> 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 we expect the MIR in future model updates will converge to 'BBB-sf' or to any rating between 'BBB-sf' and 'BB-sf'. In the second example, the assigned rating may be 'B+sf', despite an MIR of 'BB-sf', if other quantitative and qualitative factors are considered as per the second bullet point under [Rating Determination](#).

<sup>2</sup> For example: MIR = 'AAsf' and current rating = 'A-sf'. The rating may be affirmed at 'A-sf' or upgraded to 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'.

### Asset Model - Loan Aggregation Diagram



Source: Fitch Ratings

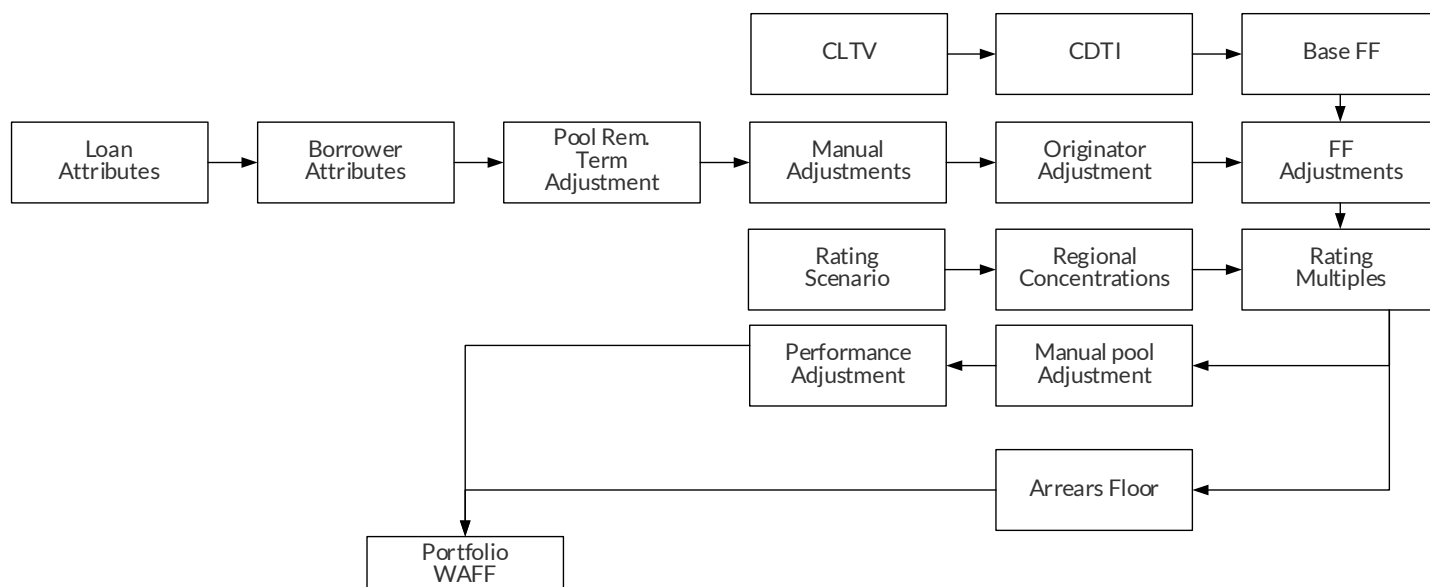
The asset model does not take into account financial obligations of borrowers relating to loans not included in the portfolio, unless such obligations are secured upon the same property as the loans in the portfolio and rank in priority.

### Asset Model: Foreclosure Frequency

Fitch's asset model calculates loan-level FF assumptions. The asset model outputs a portfolio 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



Source: Fitch Ratings



### **‘Bsf’ Representative Pool WAFF**

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 has been derived from an analysis of the historical data of securitised and unsecuritised mortgage performance in China. 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.

The representative pool ‘Bsf’ WAFF assumption is shown in the [Key Assumptions](#) section of this criteria report. The China representative pool ‘Bsf’ WAFF will change in the event of significant changes in the macroeconomic outlook for the country.

Fitch has defined the China representative pool composition for the purpose of calibrating the criteria assumptions. The pool comprises 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.

### **Base FF**

A loan-level base FF is derived from the FF matrix, which captures the expected impact of borrower-level unindexed CLVR and CDTI within the loan-level FF assumption. The FF matrix is shown in the China assumption sheet.

### **CLVR Calculation**

The unindexed CLVR is calculated at the borrower-level by dividing (i) the borrower’s current loan balances into (ii) the original valuation of the borrower’s properties.

- The borrower’s current loan balances are added together.
- The security value at origination (DT14, DT21, DT28, DT35 and DT42) of the borrower’s properties is summed.
- 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 may be used when the number of properties securing the same loan exceeds the reporting limitation of the APAC Fitch RMBS Data Template.

### **CDTI Calculation**

CDTI is calculated at the borrower level by dividing the assumed monthly debt payment into the monthly income of each borrower within a portfolio.

- The assumed monthly debt payment for each borrower is calculated from the current balance, 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 loan-level remaining term to maturity is the difference between the pool cut-off 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 reference rate for China. The reference rate for China is specified in the 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. Where the borrower’s annual salary is not provided or equal to zero, Fitch assumes the borrower’s DTI is the maximum allowed by prevailing regulation, and the more punitive no DTI class will be applied.



Fitch assumes different base FFs for borrowers with the CDTI lower than 40%, mapped to class 1 through class 5 in the ResiGlobal Model: APAC. Borrowers with the CDTI at or above 40% will be mapped to class 6 through class 8.

CDTI Classes								
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7 <sup>3</sup>	Class 8 <sup>6</sup>
CDTI ≥ (%)	0	20	25	30	35	40	45	55
CDTI < (%)	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, by multiplication. The value of the adjustment for each attribute is shown in the China assumption sheet.

FF adjustments apply to the following variables:

- Loan purpose (DT52): loan purpose will be considered as “second home” according to the originator’s loan-level identification, if provided. In the absence of such identification, the transaction to be rated is generically assumed to contain 25% of second-home loans, which is achieved by applying an adjustment factor of 1.05x to all loans on a loan-level basis. However, the rating committee has the discretion to alter the assumed percentage of second-home loans in the pool based on an investigation of relevant loan-level attributes in the context of applicable underwriting requirements for second-home purchases by city and over time. Fitch penalises the FF for loans that are identified as or assumed to be for second-home purchases, and the adjustment is specified in the China assumption sheet.
- Employment type (DT56): This loan-level adjustment will be applied to account for employment type differences between any securitised pool and the representative pool. Ceteris paribus, high-skilled technicians and specialised workers are assumed to be less likely to default than ordinarily employed professionals whereas self-employed persons and SME owners are assumed to be more likely to default. The adjustments are specified in the China assumption sheet. “High-skilled technicians and specialised workers” refer to employees in category II as defined by *Standards of Occupational Classification in the People’s Republic of China*, and the “other” employment type refers to ordinary occupations, which are not self-employed persons, SME owners, high-skilled technicians or specialised workers.

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.

### Pool Remaining Term

Fitch calibrates our FF estimates on all loans with an adjustment factor on a loan-level basis based on the WA remaining term of the securitised pools at closing. The remaining-term FF adjustment ranges from 0.8x for a pool with a WA remaining term of eight years or shorter, to 1.4x for a pool with a WA remaining term of 20 years; for pools with a WA remaining term between eight and 20 years, a linearly interpolated adjustment is calculated with the WA remaining term rounded to the nearest integer year. For example, a transaction with a WA remaining term of 15 years and eight months (rounded to 16 years) will be applied an adjustment of 1.2x; a pool with the WA remaining term rounded to 12 years does not receive a positive or negative remaining term adjustment on the FF.

This adjustment, derived at the initial pool cut-off date for the new rating assignment, remains unchanged over the course of the transaction life for surveillance purposes. The FF adjustment for the remaining term at closing and the transaction-specific FF assumptions will be disclosed in the transaction reports.

<sup>3</sup> Fitch expects the DTI at origination of all the underlying mortgages to not exceed 50%.

## 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 criteria. 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. The adjustment will be treated according to the [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 China. 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- 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 practice for China. 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 China.
- 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

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 China.

## Standard Multiples

Fitch defines standard FF rating multiples – those without regional concentration – at each rating category and the applicable values are shown in the China assumption sheet. 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 contains a significant buffer relative to the long-term average historical performance. Fitch expects the representative pool 'AAAsf' to remain constant through normal economic cycles.

### Regional Concentration

FF rating multiples for pools with regional concentration are defined at each rating category, and the applicable values are shown in the China assumption sheet. A regional concentration is deemed to exist if the portion of properties within a given region based on property count exceeds the assumed population distribution of the same region (for example, region 1 population = 10.0%) multiplied by a defined threshold (for instance, 2.5x). The regions, assumed population and threshold are specified in the assumption sheet.

If a regional concentration (for instance, region 1 property count = 35.0%) 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 concentration multiples, as specified in the China assumption sheet.

The 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:  $35.0\% - 10.0\% \times 2.5 = 10.0\%$ .

### 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 is assumed to have a particular loan attribute that would attract a loan-level FF adjustment of 1.70x according to the China assumption sheet; however, such loans cannot be identified within the loan-level data.

### Performance Adjustment

The WAFF may be subject to a further adjustment on a portfolio level in surveillance to factor in 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 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 assumptions on the prepayment rate and interest rate.

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  $\geq 6$  and  $< 7$  years and 50% in  $\geq 7$  years, if the portfolio exhibits a WA unindexed CLVR below 40% and has withstood 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's macroeconomic outlook; or (iv) the portfolio has a significant back-loaded risk profile.

### **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 China 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 for each rating category level (Bsf to AAAsf), and also for the expected case, as the average of the performing pool WAFF and the arrears pool WAFF, weighted by the current balance (DT8).

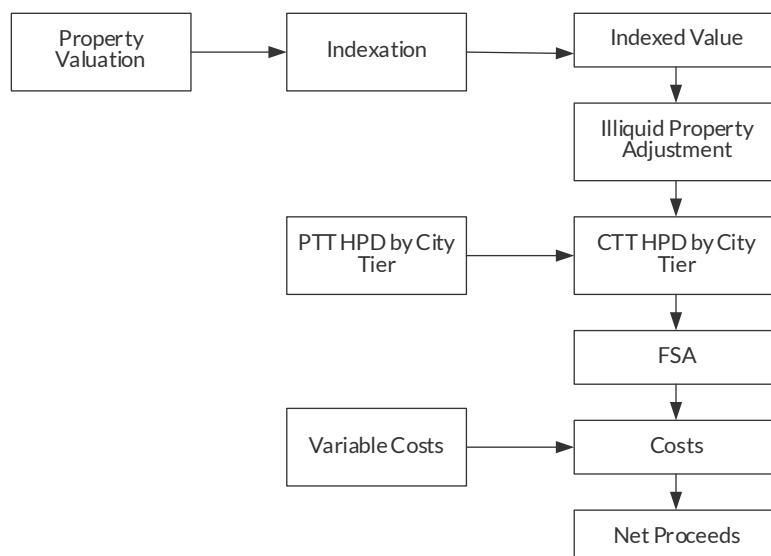
The asset model provides a notch-level portfolio WAFF for notches from 'B-sf' to 'AAAsf' by interpolating between category level outputs; for example, 'AA+sf' WAFF is equal to 'AAsf' WAFF plus a third of the difference between 'AAAsf' WAFF and 'AAsf' WAFF. The notch-level WAFFs are input to the multi-asset and covered bond cash flow models for RMBS and covered bonds, respectively. The expected case output of the China module in the ResiGlobal Model: APAC is used as the base case and 'CCCs' input to the Multi-Asset 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 valuation amount (DT14, DT21, DT28, DT35 and DT42). The applicable valuation date for the property will be equal to the loan origination date (DT6).

Where there is more than one property per loan, the applicable property type, region, valuation date, province and property size 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 first property listed with a property ID.

#### 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 HPI observation within the model. Indexation is applied according to HPI shown in the China 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 our expectation that such values may suffer a higher degree of downward movement in a downturn.

The illiquid property adjustment threshold is based on the floor area of the property, is specified in the China 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, which is 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) HPD assumptions are shown in the [Key Assumptions](#) section.

Fitch's HPD assumptions are applied on a current-to-trough (CTT) basis. HPD assumptions vary by city tier (Tier 1, Tier 2 and Tier 3) and the rating scenario category. Current in this usage refers to the most recent observation in the HPI as shown in the China assumption sheet.

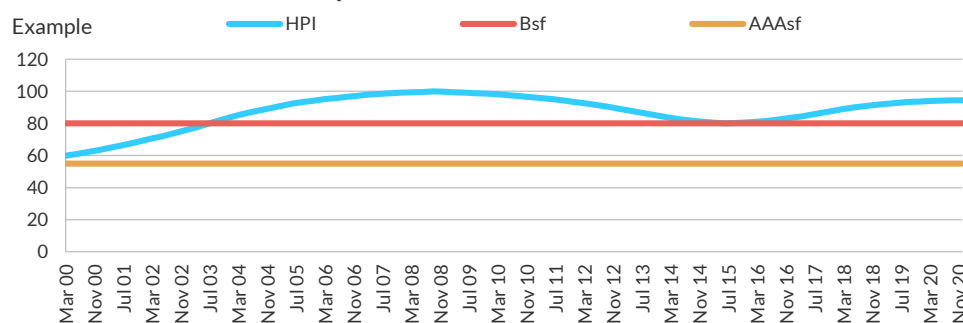
### PTT HPD by City Tier

PTT HPD assumptions for varied city tiers are derived from an analysis of historical data combined with forward-looking expectations. The 'Bsf' PTT HPD assumption captures Fitch's forward-looking perspective on the home price trend in China with a narrow margin of safety. The 'AAAsf' PTT HPD assumptions are determined to provide a significant buffer relative to historical trends and expectations.

### CTT HPD by City Tier

CTT HPD assumptions for varied city tiers are calculated using the assumed PTT HPD and the observed peak-to-current (PTC) HPI movement with the formula below. The chart below for illustration purpose shows 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



The HPI was 90 as of December 2016, 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:

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

### HPD Update Process

Fitch updates HPI values, the illiquid property threshold and CTT HPD assumptions when the asset model is required to be run, but not more frequently than quarterly, subject to the availability of updated HPIs.

CTT HPD assumptions are updated to reflect the latest PTC observation by applying the above calculations. If future HPI levels 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 reference peak and may redefine PTT HPD assumptions.

The 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) is further subject to an 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.

The calibration of the FSA is informed by an analysis of the assumption setting in peer jurisdictions, supplemented with qualitative considerations.

The FSA assumption is specified in the [Key Assumptions](#) section.

### **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 (e.g. insulation, heating, lighting, etc.), as typically measured via an energy performance certificate (EPC) 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 city tier and rating stress category is detailed in the assumption sheet. The MVD in the asset model 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.

$$\text{MVD} = 1 - [(1 - \text{FSA}) \times (1 - \text{HPD})]$$

### **Foreclosure Costs**

The property-level recovery proceeds are further reduced to factor in assumed foreclosure costs, which are applied on a variable basis. Variable costs are applied as a percentage of the indexed property value after reduction for any illiquid-property adjustment, HPD and FSA.

The variable foreclosure costs are specified in the China assumption sheet.

### **Borrowers with Multiple Loan Accounts**

For borrowers who have multiple loan accounts, their aggregated property-level recovery proceeds after the application of foreclosure costs (floored at zero) are proportionally allocated to each loan account based on the current balance (DT8).

## **Asset Model: Recovery Rate**

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

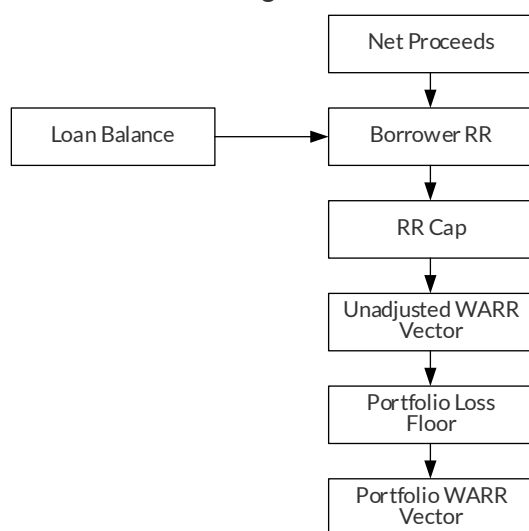
The portfolio-level RR assumptions are input to the multi-asset and covered bond cash flow models for RMBS and covered bonds, respectively.

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 the current balance (DT8).

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 [CDTI Calculation](#) section.

#### RR Cap

The borrower-level RR is limited to an amount of 100%, as disclosed in the China assumption sheet.

#### Unadjusted WARR Vector

Within the asset model, the unadjusted 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'.

#### Portfolio Loss Floor

The asset model applies a portfolio loss floor to each portfolio. The floor is intended to ensure sufficient credit enhancement to mitigate against the risk of idiosyncratic recovery outcomes within a portfolio that would otherwise have a very low loss expectation.

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

- $WAFF \times (1 - WARR \text{ Middle})$

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.

China's portfolio loss floor at the 'AAAsf' level is specified in the assumption sheet. The portfolio loss floor below 'AAAsf' is calculated by applying the portfolio loss floor scaling factors shown in the assumption sheet to the 'AAAsf' loss floor.

The portfolio loss floor 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 and the category portfolio loss floor calculated with the scaling factor as outlined above.
- The floored loss at each rating-notch level (for instance, AA+sf) is calculated as the notch-specific WAFF x (1-notch-specific floored WARR).
- The floored WARR at each rating-category level is calculated as 1 less (category-specific floored loss/category-specific WAFF), and floored at 0%.
- The floored WARR at each rating-notch level is interpolated from the floored WARR at each rating-category level. 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.

## Portfolio WARR Vector

The portfolio WARR vector is calculated for each rating-category level (Bsf to AAAsf), and also for the expected case, 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.

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 an 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'. The 'Bsf' cash flow modelling assumptions as per the tables in this section are used as the 'B-sf', expected case and 'CCCsf' assumptions.

### Amortisation Profile

The asset model outputs a scheduled monthly amortisation profile for the portfolio in respect of the current loan 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 [CDTI 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.

### Annual Prepayment Rate

Rating scenario	High (%)	Low (%)
AAA <sub>sf</sub>	20.0	3.0
AA <sub>+</sub> <sub>sf</sub>	18.2	3.0
AA <sub>sf</sub>	17.3	3.0
AA <sub>-sf</sub>	16.4	3.0
A <sub>+</sub> <sub>sf</sub>	15.6	3.0
A <sub>sf</sub>	14.7	3.0
A <sub>-sf</sub>	13.8	3.0
BBB <sub>+</sub> <sub>sf</sub>	12.9	3.0
BBB <sub>sf</sub>	12.0	3.0
BBB <sub>-sf</sub>	12.0	3.0
BB <sub>+</sub> <sub>sf</sub>	12.0	3.0
BB <sub>sf</sub>	12.0	3.0
BB <sub>-sf</sub>	12.0	3.0
B <sub>+</sub> <sub>sf</sub>	12.0	3.0
B <sub>sf</sub>	12.0	3.0

Source: Fitch Ratings

### Foreclosures

The asset model provides a WAFF assumption for each rating scenario. In each 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 or arrear assets (for instance, pro rata triggers based on defaults or 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

Month from cut-off date	Front-loaded (%)	Middle-loaded (%)	Back-loaded (%)
1-12	20.0	10.0	2.5
13-24	20.0	10.0	2.5
25-36	15.0	10.0	5.0
37-48	15.0	10.0	5.0
49-60	15.0	10.0	5.0
61-72	10.0	7.5	5.0
73-84	5.0	7.5	10.0
85-96		7.5	10.0
97-108		7.5	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.

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	Months
AAA <sub>sf</sub>	50
AA <sub>sf</sub>	46
A <sub>sf</sub>	42
BBB <sub>sf</sub>	38
BB <sub>sf</sub>	34
B <sub>sf</sub>	30

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.
- 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.

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.

### 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.

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; instead, 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. 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 (%)
AAA <sub>sf</sub>	0.45
AA+ <sub>sf</sub>	0.42
AA <sub>sf</sub>	0.40
AA- <sub>sf</sub>	0.38
A+ <sub>sf</sub>	0.37
A <sub>sf</sub>	0.35
A- <sub>sf</sub>	0.33
BBB+ <sub>sf</sub>	0.32
BBB <sub>sf</sub>	0.30
BBB- <sub>sf</sub>	0.30
BB+ <sub>sf</sub>	0.30
BB <sub>sf</sub>	0.30
BB- <sub>sf</sub>	0.30
B+ <sub>sf</sub>	0.30
B <sub>sf</sub>	0.30
B- <sub>sf</sub>	0.30
CCC <sub>sf</sub>	0.30

Source: Fitch Ratings

## Interest Rates

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

## Key Assumptions

Key assumptions are shown below. These assumptions are key inputs to the calibration of the detailed assumptions and reflect Fitch's overall assessment of standard mortgage portfolios in China.

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

## Key Assumptions

FF	
Representative pool WAFF – 'Bsf' (%)	2.8
Representative pool FF multiple – 'AAA <sub>sf</sub> ' (x)	6.0
Representative pool WAFF – 'AAA <sub>sf</sub> ' (%)	16.8
RR	
Reference peak	August 2021
PTT assumption Tier 1 cities – 'Bsf' (%)	10.0
PTT assumption Tier 2 cities – 'Bsf' (%)	15.0
PTT assumption Tier 3 cities – 'Bsf' (%)	20.0
PTT assumption Tier 1 cities – 'AAA <sub>sf</sub> ' (%)	50.0
PTT assumption Tier 2 cities – 'AAA <sub>sf</sub> ' (%)	55.0
PTT assumption Tier 3 cities – 'AAA <sub>sf</sub> ' (%)	65.0
FSA (%)	35.0

Source: Fitch Ratings



## 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, which is called variation. 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 rating 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](https://www.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:

- Portfolio-specific default distributions that differ from criteria.
- Originator adjustments, if not 1.0x.
- Rating assumption sensitivity analysis results (for new ratings only).
- The FF adjustment for the remaining term at closing and the transaction-specific FF assumptions.
- Any override to the assumed presence of second home loans in the pool.
- Any other significant loan-level or pool-level data adjustments.
- 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
AAA <sub>sf</sub>	AA+ <sub>sf</sub>	AA <sub>sf</sub>
AA <sub>sf</sub>	AA- <sub>sf</sub>	A+ <sub>sf</sub>
A <sub>sf</sub>	A- <sub>sf</sub>	BBB <sub>sf</sub>
BBB <sub>sf</sub>	BBB <sub>sf</sub>	BBB- <sub>sf</sub>
BB <sub>sf</sub>	BB- <sub>sf</sub>	B+ <sub>sf</sub>
B <sub>sf</sub>	<B <sub>sf</sub>	<B <sub>sf</sub>

Source: Fitch Ratings

### Rating Sensitivity to Decrease in RR

Original Rating	15% decrease	30% decrease
AAA <sub>sf</sub>	AA <sub>+</sub> <sub>sf</sub>	AA <sub>-sf</sub>
AA <sub>sf</sub>	A <sub>+</sub> <sub>sf</sub>	A <sub>sf</sub>
A <sub>sf</sub>	BBB <sub>+</sub> <sub>sf</sub>	BBB <sub>-sf</sub>
BBB <sub>sf</sub>	BBB <sub>sf</sub>	BB <sub>+</sub> <sub>sf</sub>
BB <sub>sf</sub>	BB <sub>-sf</sub>	B <sub>sf</sub>
B <sub>sf</sub>	<B <sub>sf</sub>	<B <sub>sf</sub>

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
AAA <sub>sf</sub>	AA <sub>sf</sub>	A <sub>+</sub> <sub>sf</sub>
AA <sub>sf</sub>	A <sub>sf</sub>	A <sub>-sf</sub>
A <sub>sf</sub>	BBB <sub>sf</sub>	BB <sub>+</sub> <sub>sf</sub>
BBB <sub>sf</sub>	BBB <sub>-sf</sub>	BB <sub>sf</sub>
BB <sub>sf</sub>	B <sub>+</sub> <sub>sf</sub>	B <sub>sf</sub>
B <sub>sf</sub>	<B <sub>sf</sub>	<B <sub>sf</sub>

Source: Fitch Ratings

## Appendix 1: Data Fields

### APAC Fitch RMBS Data Template

Field number	Field name	Applicability to China
DT1	Row Number	Yes
DT2	Pool Cut-off Date	Yes
DT3	Loan Type	Yes
DT4	Loan ID	Yes
DT5	Borrower ID	Yes
DT6	Loan Origination Date	Yes
DT7	Loan Maturity Date	Yes
DT8	Current Balance	Yes
DT9	CLVR_Override	Yes
DT10	Scheduled Balance <sup>4</sup>	Yes
DT11	Scheduled LVR_Override	No
DT12	Prior Charge Amount	No
DT13	Property 1 ID	Yes
DT14	Property 1 Value	Yes
DT15	Location 1	Yes
DT16	Province 1	Yes
DT17	Valuation Date 1	Yes
DT18	Property Type 1	Yes
DT19	Property Size (sq m) 1	Yes
DT20	Property 2 ID	Yes
DT21	Property 2 Value	Yes
DT22	Location 2	Yes
DT23	Province 2	Yes
DT24	Valuation Date 2	Yes
DT25	Property Type 2	Yes
DT26	Property Size (sq m) 2	Yes
DT27	Property 3 ID	Yes
DT28	Property 3 Value	Yes
DT29	Location 3	Yes
DT30	Province 3	Yes
DT31	Valuation Date 3	Yes
DT32	Property Type 3	Yes
DT33	Property Size (sq m) 3	Yes
DT34	Property 4 ID	Yes
DT35	Property 4 Value	Yes
DT36	Location 4	Yes
DT37	Province 4	Yes
DT38	Valuation Date 4	Yes
DT39	Property Type 4	Yes

<sup>4</sup> Required input for the ResiGlobal Model: APAC. Same value as DT8 current balance in the case of China.

## APAC Fitch RMBS Data Template (Cont.)

Field number	Field name	Applicability to China
DT40	Property Size (sq m) 4	Yes
DT41	Property 5 ID	Yes
DT42	Property 5 Value	Yes
DT43	Location 5	Yes
DT44	Province 5	Yes
DT45	Valuation Date 5	Yes
DT46	Property Type 5	Yes
DT47	Property Size (sq m) 5	Yes
DT48	Lenders mortgage insurance (LMI) Provider	No
DT49	Issuer for LMI QA	No
DT50	Non-Resident	Yes
DT51	Annual Salary	Yes
DT52	Loan Purpose	Yes
DT53	Interest-Only End Date	No
DT54	Arrears Status (days)	Yes
DT55	Documentation Type	Yes
DT56	Employment Status	Yes
DT57	Overdraft Loan	No
DT58	Interest Rate Type	Yes
DT59	First-Time Home Buyer	Yes
DT60	Effective Interest Rate	Yes
DT61	Fixed-Rate End Date	Yes
DT62	Prior Defaults	Yes
DT63	Bankruptcy, Individual Voluntary Arrangement or Equivalent	Yes
DT64	Staff Loan	Yes

Source: Fitch Ratings

## Appendix 2: Data Sources

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

### Representative Pool FF Rate

- Over 250 RMBS transactions' performance data, plus historical arrears, static and dynamic mortgage book performance data from 22 banks, which represent over 90% of China's residential mortgage market.
- Macroeconomic data from the People's Bank of China and National Bureau of Statistics.

### Loan-Level FF Adjustments

- Regression analysis of loan performance versus loan-level attributes sourced from securitised deals of a Chinese prominent residential mortgage lender and RMBS issuer, plus historical arrears data from Chinese banks based on the People's Bank of China shelf registration documents; all Chinese RMBS transactions' performance data.
- Regional population distribution from the National Bureau of Statistics.

### House Price Indices (by City Tier)

- From National Bureau of Statistics.

### Illiquid-Property Adjustment Threshold

- HPIs for different property size categories.

### Foreclosure Timing Assumptions

- Discussions with servicers and legal counsel in relation to enforcement process.

### 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

<a href="#">Global Structured Finance Rating Criteria (March 2023)</a>
<a href="#">Structured Finance and Covered Bonds Counterparty Rating Criteria (July 2022)</a>
<a href="#">Structured Finance and Covered Bonds Counterparty Rating Criteria: Derivative Addendum (August 2022)</a>
<a href="#">Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria (September 2021)</a>
<a href="#">Structured Finance and Covered Bonds Country Risk Rating Criteria (December 2022)</a>
<a href="#">Covered Bonds Rating Criteria (November 2022)</a>
<a href="#">SME Balance Sheet Securitisation Rating Criteria (October 2021)</a>
Source: Fitch Ratings

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