

# Rating Research Services

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## Taiwan Residential Mortgage-Backed Securities Rating Criteria

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# Taiwan Residential Mortgage-Backed Securities Rating Criteria

*(Editor's note: We originally published this criteria article on Dec. 25, 2012. We are republishing this article following our periodic review completed on Nov. 28, 2014. The referenced criteria and research are updated in this article.)*

1. This criteria article outlines the ratings criteria and methodology underlying our analysis of residential mortgage-backed securities (RMBS) transactions in Taiwan. This article is related to the principles discussed in "Principles Of Credit Ratings," published Feb. 16, 2011. Other related criteria and research are referenced at the end of this criteria article.

## SCOPE OF THE CRITERIA

2. The criteria apply to all existing and future ratings on RMBS transactions in Taiwan.

## METHODOLOGY

3. Our RMBS rating methodology concentrates on analyzing the securitized mortgage pool, transaction structure, and legal risks. To support this analysis a review of the mortgage originator and servicer will be undertaken and the potential effects on asset quality, management and proceeds collections in a transaction, will be factored into the analysis. Although RMBS transactions vary in type and most transactions incorporate different characteristics, there are some common questions that need to be answered for the rating analysis:
  - What percentage of the mortgage loans are likely to default over the life of the RMBS?;
  - What percentage of the defaulted loan amounts are likely to be lost after the cash recovery from the liquidation of its collateral (i.e. the property)?;
  - What is the portfolio's estimated loss due to credit issues?; and
  - What amount of credit support is likely to be needed so that this loss is likely to be covered?
4. The answer for the first question is approximated using the estimated default frequency of a securitized pool, while that for the second question is approximated using estimated loss severity. The estimated credit loss for the pool is the product of the estimated default frequency and estimated loss severity. Under each rating stress scenario, the estimation of these parameters will differ because the higher the rating, the more stress the transaction will be assumed to be able to bear. The credit loss coverage under each rating scenario should be sufficient to cover the estimated credit losses respectively.
5. The aforementioned credit risk analysis will be supplemented by cash flow analysis, which considers mortgage delinquency, default timing, prepayment speed, interest rate movements, and other cash payment factors. Aside from this, we conduct analysis regarding the transaction's structural risks and legal risks.

## Analysis of Credit Loss Coverage

### Benchmark Pool for Taiwan RMBS Rating Analysis

6. Our rating methodology in considering the credit risk for Taiwan residential mortgage loans is based on our analysis of macroeconomic data, real estate characteristics, historical real estate performance, financial institution residential loan delinquency, and foreclosure experience through different economic cycles or stresses. These factors will be reflected in the characteristics of a benchmark pool and the associated default frequency and market value decline levels of the benchmark pool (see table 1). Market value decline levels together with related liquidation costs will

be reflected in a loss given default, or loss severity. When the securitized pool deviates from the benchmark pool, we will consider adjusting the default frequency and loss severity assumptions, which will impact the credit support levels.

Table 1

Benchmark Pool Characteristics							
Pool size:	A minimum of 300 loans						
Loan seasoning:	A minimum of one payment has been made						
Maximum loan size:	Taipei City - NT\$6 million; other areas - NT\$3.5 million						
Loan-to-value ratio:	A maximum of 70%						
Loan type:	Fully amortized						
Loan term:	20 years						
Security:	First ranking lien on freehold land and building						
Property type:	Owner-occupied, apartment/condominium units						
Geographic dispersion:	Area* <table border="1" data-bbox="516 713 1435 907"> <tr> <td>Taipei City - a maximum of 75%</td> </tr> <tr> <td>Northern metropolitan area including Taipei County, Taoyuan County, Hsinchu County, and Hsinchu City - at a maximum, 40%</td> </tr> <tr> <td>Central Taiwan and other northern Taiwan (including Ilan County in upper east Taiwan) - at a maximum, 25%</td> </tr> <tr> <td>Southern and eastern Taiwan - at a maximum, 25%</td> </tr> </table> By postcode <sup>‡</sup> <table border="1" data-bbox="516 950 1435 1004"> <tr> <td>Exposure by postal code - Taipei City - a maximum of 10%</td> </tr> <tr> <td>Exposure by postal code - all other areas - a maximum of 5%</td> </tr> </table>	Taipei City - a maximum of 75%	Northern metropolitan area including Taipei County, Taoyuan County, Hsinchu County, and Hsinchu City - at a maximum, 40%	Central Taiwan and other northern Taiwan (including Ilan County in upper east Taiwan) - at a maximum, 25%	Southern and eastern Taiwan - at a maximum, 25%	Exposure by postal code - Taipei City - a maximum of 10%	Exposure by postal code - all other areas - a maximum of 5%
Taipei City - a maximum of 75%							
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Southern and eastern Taiwan - at a maximum, 25%							
Exposure by postal code - Taipei City - a maximum of 10%							
Exposure by postal code - all other areas - a maximum of 5%							
Property age:	Less than 10 years at the time of securitization, unless deemed in good condition and in prime location						
Borrower status:	Individual						
Borrower residency:	Domiciled in Taiwan						
Borrower employment status:	Salaried or professional						
Borrower credit:	No negative credit history; borrower must have clean payment record on mortgage loans and other loans held with the originator for the past six months						
Borrower age:	Between 20 years and 60 years old						
Loan record:	Securitized mortgage loan or other borrowings with the originator have not been restructured for credit reasons within 24 months and loan remains current at closing						
Loan repayment:	Direct debit from the borrower's account						
Use of funds:	To purchase home or to refinance existing mortgages without taking equity out						
Loan interest:	Fixed rate and variable rate						
Insurance:	Earthquake insurance coverage according to the official limit; fire insurance to cover at minimum the replacement cost						

\*Geographical and regional economic conditions differ in Taiwan. This is reflected in the performance of residential mortgages, and also, in the liquidity and resale value of properties. For analytical purpose, the benchmark pool is divided into four areas, (1) Taipei City, (2) other northern metropolitan area, including Taipei County, Taoyuan County, Hsinchu County, and Hsinchu City, (3) central Taiwan and other northern Taiwan (including Ilan County), and (4) southern and eastern Taiwan.

‡Geographic diversification reduces systematic risk to a transaction because of lower probability that a single natural catastrophe (for instance, earthquakes) would affect a significant portion of residential mortgages. In this regard, mortgage portfolios will be classified by property zip code and the percentage of mortgage in each zip code will be limited.

## Estimated Default Frequency

7. The default frequency is the estimated percentage of initial loan balance in a pool that may default. Our benchmark default frequency assumptions are shown in table 2.

**Table 2**

### Benchmark Default Frequency Assumptions

Rating Scenario	'twAAA'	'twAA'	'twA'	'twBBB'
Default frequency (%)	11	9	7	5

## Estimated Loss Severity

8. Loss severity is the estimated loss that may be realized on a defaulted loan. Loss severity is affected by the market value decline in the underlying property market and costs associated with enforcing and liquidating the mortgage. The market value decline assumption is based on an assessment of Taiwan's property market. Four sets of market value decline ratios (one for each rating scenario) are assumed for each of the four areas based on loss experience, real estate status, and macroeconomic conditions.

**Table 3**

### Benchmark Market Value Decline Assumptions (%)

Area / Rating Scenario	'twAAA'	'twAA'	'twA'	'twBBB'
Taipei City	30	26	22	18
Northern metropolitan area	36	32	28	24
Central and other northern Taiwan (including Ilan County)	48	44	40	36
Southern and eastern Taiwan	48	44	40	36

9. Loss severity is estimated based on the loan-to-value, stressed-market value decline, and costs associated with the possession and disposal of the property. For example, the assumptions that are considered in relation to loss severity for a 'twAAA' rating scenario are:
- 70% loan-to-value ratio;
  - 24 months accrued interest at 9% on loan balance;
  - An average of 1.5 auctions to sell each property;
  - Cost to sell at 4% of new market value; and
  - Other costs at 3% of total loan balance.
10. The cost of disposing a foreclosed property includes filing for the auction process and miscellaneous administration costs. One auction is assumed for the disposal of property from all areas. However, for 'twAAA' rating scenarios, we will assume that the defaulted mortgage requires 1.5 auctions for disposal on average. We will monitor the auction discount over time and reduce this rate as warranted. A loss severity estimation is illustrated in table 4.

Table 4

Loss Severity Calculation Illustration For Taipei City (twAAA rating scenario)	
(NT\$)	
Original property value	1,000,000
Less 30% decline in market value	300,000
Equals: New market value (NMV)	700,000
Less 30% from NMV due to court auction*	210,000
Equals: liquidated value	490,000
Less loan balance (loan-to-value ratio at 70%)	700,000
Equals: principal loss	(210,000)
Less foreclosure costs	
24 months accrued interest at 9%	(126,000)
Selling costs (4% of new market value)	(28,000)
Legal and other costs (3% of loan balance)	(21,000)
Total loss	(385,000)
Loss severity (total loss/loan balance) (%)	55.00

\*30% for 'twAAA'; 20% for other rating scenarios. NT\$--New Taiwan dollar.

## Estimated Credit Loss

11. The estimated credit loss in respect of a transaction is the product of Taiwan Ratings' assumed weighted average default frequency and weighted average loss severity for the pool. The estimation of benchmark credit loss for different rating scenarios is shown in table 5 with a 70% loan-to-value ratio. The ultimate credit support for a transaction, however, reflects our cash flow analysis and view of other structural risks, such as liquidity risk, setoff risks and commingling risks.

Table 5

Rating scenario	Estimated Default Frequency				Estimated Loss Severity				Estimated Credit Loss			
	'twAAA'	'twAA'	'twA'	'twBBB'	'twAAA'	'twAA'	'twA'	'twBBB'	'twAAA'	'twAA'	'twA'	'twBBB'
Taipei city	11	9	7	5	55	41	36	32	6.1	3.7	2.5	1.6
Northern metropolitan area	11	9	7	5	61	47	43	39	6.7	4.2	3.0	1.9
Central and other northern Taiwan (including Ilan County)	11	9	7	5	72	60	56	52	7.9	5.4	3.9	2.6
Southern and eastern Taiwan	11	9	7	5	72	60	56	52	7.9	5.4	3.9	2.6

## Adjustment to Estimated Credit Loss

12. Most of the securitized pools we analyze do not have the same characteristics as the benchmark pool, and the rating analysis will carry out a comparison of the securitized loan pool with the benchmark pool. The default frequency and loss severity assumptions of the benchmark pool may be adjusted to reflect the greater or lower risks associated with the actual securitized pool. Factors that may affect the default or loss severity of a pool vary. The following are major considerations affecting adjustments.

### Origination quality and servicer strength

13. Mortgage loans origination quality, approval process and lending standards considered, will affect the credit quality of the securitized assets. Taiwan Ratings will consider this in the default frequency analysis. For the servicer responsible for collecting interest and principal payments for a loan, the

quality of the servicing may increase or reduce losses for RMBS investors. A servicer with a strong collection mechanism may be able to better identify and collect on delinquent loans and therefore, in Taiwan Ratings' experience, the likelihood of losses should be less. The portfolio loss severity will thus be considered in light of the servicing quality. Servicing quality also affects transactions' administration and operations, and Taiwan Ratings will pay attention to it throughout the life of the transactions as part of its deal surveillance.

### **Pool size**

14. In Taiwan Ratings' opinion, to perform a meaningful statistical analysis, a portfolio of at least 300 loans is needed. For portfolios with less than 300 loans, a small pool penalty will be applied to capture increased uncertainty due to the smaller sample.

### **Loan seasoning**

15. The benchmark portfolio will have a minimum of one month of payment history, though seasoned loans--mortgages that have been outstanding for a significant period of time--are assumed less risky in our rating analysis. This is due to the observation that for most mortgage portfolios, the default curve is front loaded. To the extent that a loan has a long seasoning, the default frequency may reflect a lower risk of default.

### **Size of residential mortgage**

16. The size of a residential mortgage loan is factored in to determine its credit quality. In Taiwan Ratings' experience, during economic downturns, mortgage loans are more likely at risk because borrowers may have reduced cash flows to service debts, which is more obvious when their mortgage loan balance is high. Borrowers' flexibility in selling their properties to pay down their mortgage may also be limited because liquidity for more expensive properties will be low under economic stress, and these illiquid properties may only be sold at a large discount.

### **Size of property**

17. In Taiwan Ratings' experience, the size of property may be considered as an alternative or a supplement to the factor of the size of the mortgage. A property size that deviates from the normal range will usually be less liquid and may result in greater market value declines. A normal-sized housing unit may differ in a city and in a county where population densities differ. For Taipei City, for example, the normal property size (including the shared public area) ranges from 20 pings (1 ping is roughly 3.3 square meters) to 50 pings. Housing units that are smaller than 20 pings, from Taiwan Ratings' observation, are mainly for young individuals and couples who are purchasing their first homes. In Taiwan Ratings' experience, properties between 50 pings and 80 pings, the deluxe level, and those over 80 pings, the luxury level, are more sensitive to market value decline in times of macroeconomic distress. The normal property size outside Taipei is generally more spacious because of the large gap in unit property prices between Taipei City and other regions of Taiwan. Nonetheless, in Taiwan Ratings' experience, larger properties outside Taipei are somewhat less liquid in the secondary market.

### **Loan-to-value (LTV)**

18. The LTV ratio is defined as the mortgage balance divided by the value of the property used as collateral to secure the mortgage (net of land value incremental tax at origination). The loan-to-value ratio is a key factor affecting both default frequency and loss severity. In Taiwan Ratings' experience, when faced with financial distress, borrowers with higher loan-to-value ratios have a higher propensity to default as they have less equity in the property. Also, as illustrated, loss severity will increase as the loan-to-value ratio increases (see table 4).

### **Loan repayment type**

19. The majority of the residential mortgages in Taiwan are amortizing loans with a tenor of 20 years. An amortizing loan enables a borrower to make monthly principal and interest payments. Because the loan principal is reduced over time, the risk of loss upon default is lower than that with a balloon mortgage where the entire principal balance is due on the maturity date. Moreover, the likelihood to default decreases over time as the borrower, through repayments, reduces the loan balance, and builds up more equity in the property.

### **Loan purpose**

20. The purpose of a loan is another important factor when considering portfolio risk. The benchmark pool includes only owner-occupied loans for freehold. When a property is occupied by the owner, in Taiwan Ratings' experience, the borrower has a strong incentive to keep the mortgage current. Mortgage loans originated on investment properties, for which owners do not reside in and intend to sell them in the future, tend to perform worse in Taiwan Ratings' experience and therefore a penalty is applied to the default frequency for such related mortgages. Loans for purchasing a property or for refinancing of a property may form part of the securitized pool. Refinanced loans with some cash taken out (i.e., where the borrower refinances a mortgage and obtains a larger loan) are of higher risk in rating analysis, as the equity in the property to the borrower is smaller. For rating purposes, refinanced loans with cash out would attract a penalty.

### **Borrower employment status**

21. Based on historical data and discussions with lenders, the employment status of the borrower is important for determining credit risk. Salaried employees or professionals default less frequently, in Taiwan Ratings' experience, than waged employees, commission-based employees, or those who are self-employed. This is because the sources of income for the latter are slightly more uncertain, especially during an economic downturn.

### **Loan record**

22. Loans in the benchmark pool must be current at the time of closing. A delinquent loan suggests payment uncertainty and if included in the securitized portfolio, such loans would be assumed to have a higher likelihood of default. Similarly, past payment history is a good predictor of loan quality. A penalty is applied to the default frequency for loans where the borrower has frequently made late payments.

## **Cash Flow Analysis**

23. RMBS transactions will employ a specific mechanism through which cash flow from the securitized mortgage loans is allocated. Taiwan Ratings will review the mechanism and associated priority of payments to each class of issued notes, as well as tax and transaction expenses such as servicing and trustee fees. We will also consider the effects of any changes to the priority of payments resulting from trigger events that are built into the structures.
24. A cash flow model of the transaction should be prepared to replicate the transaction's asset and liability structure over its entire life, by following the aforementioned cash flow mechanism and priority of payments. The model will be used to analyze, for example, proceeds collections, payment priority, possible negative carry, excess cash flow allocation, interaction with the interest rate environment, as well as proposed credit enhancement and liquidity levels. Cash flows are stressed to reflect various rating scenarios' assumptions to ensure timely payment of interest and repayment of principal by no later than the final maturity date.
25. Cash flow assumptions used in such stress analysis differ from transaction to transaction, in response to the different loan portfolio and arrangement of the structure. The following shows an

example of such assumptions.

- Five waves of mortgage defaults are assumed to occur at different intervals over 6 months during a recession, with front-loaded, back-loaded, and average default curve assumptions;
  - The first wave of mortgage default begins six months after closing;
  - Any defaulted mortgages will take 24 months to liquidate and therefore recoveries assumed for each rating category will take 24 months to become available;
  - Government interest subsidies could be recognized with a delay of a certain number of months depending on the program;
  - Cash flow will be tested under simulated rising, falling, and other more complex interest rate scenarios;
  - Mortgages may be in arrears and not contributing interest and principal cash flows to the transaction, for which ongoing delinquency stresses are modeled based on 50% of the assumed cumulative default rate and persisting for up to six months, while delinquency stresses are modeled for the life of the transaction;
  - Cash flow is tested for a low prepayment rate of 0% conditional prepayment rate; a high prepayment rate scenario will also be tested; and
  - Cash flow needs to be sufficient for issuer's tax obligations, back-up servicer fees, third party expenses and fees, and certain extraordinary expenses.
26. If an external credit support, such as a notes insurance policy or explicit guarantee, is supporting the transaction by obligating a third party/cash facility to make notes payments when necessary, the support coverage and related terms and conditions to use it will also be analyzed.

## Structural and Legal Analysis

27. In addition to the credit loss coverage analysis, Taiwan Ratings will consider the inherent risk of the transaction structure and associated legal risk. This is because the underlying pool's credit quality and the transaction structure are closely related to each other when supporting the RMBS payment obligations. Important factors that we will consider as part of this review include:
- Is there sufficient liquidity in the transaction to meet full and timely payment obligations of RMBS interests in accordance with the agreed terms and conditions?;
  - Aside from the transaction's pool credit risk, are the inherent risks in the transaction structure, such as set-off and commingling risk, properly mitigated?; and
  - Are investors appropriately protected from the credit risks of the related parties that provide support to the RMBS transactions?

## Structural Consideration

### Earthquake risk

28. Earthquakes, which are not uncommon in Taiwan, represent a major risk to a RMBS transaction as they may cause significant damage to the collateralized properties, thus hiking both default frequency and loss severity in the mortgage pool.
29. Earthquake risk is mainly mitigated by geographic diversification of mortgage loans. Proper geographic dispersion reduces systematic risk to a transaction because of lower probability that a single earthquake would affect a significant portion of the residential mortgages pool. Given the economic strength of Taipei City relative to other areas in Taiwan, the benchmark pool may have a maximum of 75% of the exposure to be in Taipei City. However, for diversification within Taipei City, the concentration for each postal code in Taipei City may not exceed 10%. This 10% cap also applies to some selected zip codes in other areas, whilst a more stringent zip code concentration limit is assumed for the remaining others.
30. Earthquake risk is also somewhat moderated by earthquake insurance, which is mandatory on property purchased with a residential mortgage since April 2002. Earthquake insurance coverage is



fixed at NT\$1.2 million.

### **Servicer transition**

31. During a servicer transition, collections may still be delayed. To ensure the timely payment of interest during a servicer transition, three months of RMBS interest and senior expenses will generally be set aside as reserves to be funded at the closing of the transaction. The servicer transition reserves should also include any one-time expenses required by the back-up servicer, as well as factoring in the cost of any notification to borrowers.

### **Obligors set-off**

32. Under Taiwan's Civil Code, borrowers enjoy a set-off right. A set-off is a right to net off obligations between one party and another. The amount of set-off rights could be crystallized at the time of the loan transfer so long as notification is properly given, such as the notification under the Financial Asset Securitization Law. Where the originator is a deposit taker, set-off risk is generally sized taking into account the deposit insurance regime in Taiwan with a view to avoid the special purpose trust or issuer suffering any losses when borrowers exercise their set-off rights. Set-off risk is mitigated through overcollateralization or cash reserves.

### **Commingling issue**

33. For most RMBS transactions in Taiwan, the deal arrangement will require the collections of loan interest and principal to temporarily stay in the servicer's hand with its other money, before the collections are remitted to the issuer's account. Such a temporary period could last for one business day or even longer, and the collected money could be at risk if the servicer becomes insolvent during this period. This commingling risk would be analyzed based on the cash amount subject to loss in this matter, and be mitigated through overcollateralization or cash reserves.

## **Legal and Regulatory Risk**

34. A structured finance rating is based primarily on the creditworthiness of securitized assets, without regard to the creditworthiness of the originators. The structured finance arrangement also seeks to insulate transactions from entities that are either unrated or rated lower than the targeted transaction ratings.
35. A worst-case scenario will be assumed that a non-bankruptcy remote transaction party goes into insolvency immediately after the deal closing. Taiwan Ratings will consider whether the mortgage loans are still available to pay the transaction's debt in a timely manner under such circumstances. If the transaction has designated back-up transaction parties at the time of closing for transaction's continuity upon the failure of original parties to fulfill their responsibility, Taiwan Ratings will review the successor qualifications and replacement process. The additional cost related to such replacement arrangement will also be stressed and analyzed.
36. Critical legal concerns also include whether the asset transfer from the originator to the issuance entity could be perfected. The beneficiary title of earthquake insurance, and all other types of insurance, should be duly transferred from originators to the special-purpose entities for the amount of the loan outstanding. Taiwan Ratings will check the document custodian arrangement when the seller acts as transaction servicer, too. RMBS issuers are also considered in light of our special-purpose entity criteria and be bankruptcy remote. A bankruptcy-remote special-purpose entity should be unlikely to become insolvent or be subject to the claims of creditors (who may file an involuntary petition against the entity). We consider most legal concerns in light of Taiwan's domestic laws and regulations (particularly, the Civil Code and Financial Asset Securitization Law), transaction documents, and legitimate opinions from certified counsels. For matters relating to taxation, we will consider the issuer's ability to pay its taxes via the cash flow test, based on tax treatment opinions from the issuer's legal counsel/accountant.

## RELATED CRITERIA AND RESEARCH

### Related Criteria

- **Understanding Taiwan Ratings' Rating Definitions**, [www.taiwanratings.com](http://www.taiwanratings.com), Nov. 18, 2014
- **Standard & Poor's Asset Isolation And Special-Purpose Entity Criteria--Structured Finance**, May 7, 2013
- **Standard & Poor's Principles Of Credit Ratings**, Feb. 16, 2011

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