Methodology

U.S. RMBS Surveillance Methodology

MARCH 2014
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All DBRS ratings and research are available in hard-copy format and electronically on Bloomberg and at DBRS.com, our lead delivery tool for organized, Web-based, up-to-the-minute information. We remain committed to continuously refining our expertise in the analysis of credit quality and are dedicated to maintaining objective and credible opinions within the global financial marketplace.
# U.S. RMBS Surveillance Methodology

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I. Introduction

The purpose of this report is to provide a description of the DBRS U.S. Residential Mortgage-Backed Securities (RMBS)\(^1\) surveillance process. Below are the key highlights of the surveillance methodology:

- DBRS uses its proprietary RMBS Insight model (see “RMBS Insight: U.S. Residential Mortgage-Backed Securities Loss Model and Rating Methodology” on www.dbrs.com) to monitor transaction performance to the extent updated loan-level data is available\(^2\).

- In the RMBS Insight analysis, loan-level expected losses are typically aggregated to group-level not transaction-level. DBRS subsequently feeds the expected losses to the corresponding Intex groups to perform cash flow analysis on a group level.

- The loan-level RMBS Insight model incorporates the following key enhancements from the pre-crisis period:
  1. MSA-level home price forecast to estimate owner’s equity in the property, property value at liquidation, and market value declines by rating category.
  2. Consideration of regional economic data such as unemployment rate, house price index, growth rate in civilian labor force and per-capita income on a MSA level.
  3. Concentration risk in geography and loan size.
  4. Small pool penalties.
  5. Asset correlation and simulation approach to stress rating categories.

- DBRS incorporates a dynamic cash flow analysis with 40 scenarios encompassing fast and slow prepayment speeds, front- and back-loaded loss distributions as well as upward and downward interest rate stresses in its surveillance process.

Once DBRS assigns a final rating to an RMBS security, the surveillance process begins and is continued for as long as DBRS maintains a rating on the security. DBRS monitors all of its outstanding public, Rule 144A and private ratings to ensure each rating reflects all data and information sourced and received by DBRS. In general terms, ratings are opinions that reflect the creditworthiness of an issuer, a security, or an obligation.

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1. Includes RMBS and re-securitizations of real estate mortgage investment conduits (ReREMICs) transactions, Federal Housing Administration (FHA) and Veterans Affairs (VA) securitizations and (interest rate) swap termination payments.
2. DBRS uses MBSData LLC (“MBSData”) as its primary loan-level data source, complemented by Intex Solutions (“Intex”). A relatively small percentage of DBRS-rated transactions do not have updated loan-level information. Those transactions are monitored using a shadow pool approach, which is explained in Appendix 1 to this methodology.
II. Surveillance Review Process Overview

SURVEILLANCE PROCESS
DBRS utilizes the following process in reviewing RMBS transactions (as also illustrated in the diagram below):

- Derivation of expected losses.
- Utilization of cash flow modeling.
- Analysis of cash flow results.

Figure 1: Surveillance Process

Each rating is reviewed by a rating committee at least annually, either on or before the anniversary of its last committee or sooner if a periodic review indicates a rating action may be warranted. DBRS performs these periodic reviews to allow for the consideration of performance trends and to help identify and reduce the effects of performance anomalies that could lead to unnecessary rating volatility.

DBRS calculates expected losses and performs cash flow analysis on a periodic basis. If the analysis suggests that a rating change may be in order, a rating committee is convened to review and discuss the analysis. The rating committee reviews transaction performance including both bond and collateral information. The rating also incorporates a review of relevant transaction parties and counterparties as warranted.

3. DBRS allows reasonably small fluctuations in its expected loss and cash flow analysis. With consideration for performance trends, if the results are within an acceptable threshold, the bond will not be brought to a rating committee for further review.
RATING COMMITTEES
All DBRS ratings and rating actions are determined by rating committees. The purpose of DBRS rating committees is as follows:

1. To provide objective and independent rating decisions that are a reflection of DBRS opinion, rather than the view of an individual analyst or analysts;

2. To ensure rating decisions are based on sufficient information, incorporate both global and local considerations, and apply DBRS approved methodologies;

3. To provide a checkpoint for actual and perceived conflicts of interest among analysts; and standardize the rules, procedures and documentation processes to drive efficiency and adherence with respect to rating decisions.

Rating committees have specific member composition requirements and are comprised of experienced and knowledgeable DBRS analysts, senior staff and management personnel. For monitoring existing securities, rating committees review each outstanding rating once per year, on or before the anniversary of the transaction’s previous appearance before a rating committee or on an “as needed” basis when rating events occur. This approach provides maximum flexibility, as well as permitting timely and informative rating decisions.

RATING ACTIONS
Over the life of each rated security, DBRS may change a rating by raising (upgrade), lowering (downgrade), keeping the rating the same (confirm) or ceasing monitoring of a rating (discontinue). Other rating actions include placing a rating “Under Review”. When a material event occurs that may directly impact the credit quality of a particular security, DBRS attempts to provide an immediate rating opinion. If there is uncertainty regarding the outcome of the event, and DBRS is unable to provide an objective, forward-looking opinion in a timely fashion, the rating(s) of the transaction(s) are placed Under Review.

When a decision is made by DBRS to place a rating Under Review, DBRS provides initial guidance as to its opinion by noting whether the Under Review action has Positive, Negative or Developing Implications. These descriptors indicate DBRS preliminary view of the impact on the credit quality of the security. As situations and potential rating implications may vary, a final rating conclusion may depart from the preliminary assessment. Typically, the subsequent rating action for securities placed Under Review with Positive Implications is either an upgrade or a confirmation. The subsequent rating action for securities placed Under Review with Negative Implications is typically either a downgrade or confirmation. The subsequent rating action for securities placed Under Review with Developing Implications may be an upgrade, downgrade or confirmation. A Developing description is typically used when a structured finance security is highly dependent on a corporate entity that has been placed Under Review with Developing Implications.

In cases where a rating is placed Under Review, DBRS views this as a temporary situation and strives to complete its review and remove the rating from this status as soon as it is appropriate to do so. In the event that a lengthy Under Review period is anticipated, DBRS may provide such guidance in a press release and may, if appropriate, provide guidance as to the anticipated rating that would emerge under a proposed scenario. In the event that DBRS decides to discontinue a rating that is Under Review, DBRS resolves the Under Review status prior to the discontinuance.
RATINGS
DBRS employs different rating scales for short term debt and long term debt.

Short term debt is rated on a scale ranging from R1 (high), which is the highest rating, to D which is the rating for a defaulted security. Rating categories between R1 and D are denoted as R2 through R5. The two highest rating categories, R1 and R2, have subcategories of “high” and “low”, indicating a securities credit profile is at near the top or bottom of the range. A security in the R1 or R2 category with no designation of high or low means the rating is in the middle of the range.

The DBRS long-term debt rating scale ranges from “AAA” to “D” and with the exception of the “AAA” and “D” categories is denoted by the subcategories “high” and “low”. The absence of either a “high” or “low” designation indicates the rating is in the “middle” of the category. Below is a summary of the long term debt ratings scale. Please refer to dbrs.com Rating Scales for a description.

- AAA Highest quality
- AA Superior quality
- A Good quality
- BBB Adequate quality
- BB Speculative
- B Highly Speculative
- CCC/CC/C Very Highly Speculative
- D Defaulted

DISCLOSURE – PRESS RELEASES
DBRS typically discloses rating actions made on public and rule 144a transactions through the publication of press releases with the goal of delivering high quality rating opinions in a timely manner to the market. Press releases contain the name of the issuer, the rating action taken, the final rating determined and the title(s) of the relevant methodology(ies) applied.

DBRS may publish a Performance Analytics Report (PAR) for public and 144a RMBS deals on www.dbrs.com. The PAR provides a summary of the transaction’s performance in a user-friendly format to enable market participants to assess ongoing performance.
III. RMBS Surveillance Methodology

RMBS INSIGHT: THE RESIDENTIAL LOSS MODEL
In an effort to stay consistent with the U.S. RMBS rating methodology, DBRS employs the same RMBS Insight 1.2 model to derive loan-level default probability, loss severity and expected loss for ongoing surveillance of a pool of mortgage loans, to the extent updated loan-level data is available. RMBS Insight evaluates mortgage pools on a loan-level basis, and the sum of the loss estimates from each mortgage provides the estimate of losses for a pool of loans. DBRS uses MBSData as its primary loan-level data source, complemented by Intex.

RMBS Insight consists of multiple sub-modules, or models, which cover the rating analytics of a variety of asset types that include certain agency loans and non-agency newly-originated and seasoned pools, liquidating trust (of non-performing loans or NPLs), Federal Housing Administration (FHA) and Veterans Affairs (VA) securitizations, (interest rate) swap termination payments, as well as re-securitizations of real estate mortgage investment conduits (ReREMICs).


CASH FLOW ANALYSIS
Baseline Cash Flow Analysis
Once the expected losses are derived, for transactions that may be impacted by cash flow stresses, DBRS undertakes a detailed structural analysis (currently in Intex) to ensure timely payments of principal and interest to the bonds. The cash flow modeling assumptions DBRS uses for rating RMBS transactions focus on the following risk factors:
(1) Prepayment speeds
(2) Timing of losses
(3) Interest rate stresses (when there is a mismatch between the collateral and bond coupons)

The complexity of the capital structures in RMBS transactions requires testing various combinations of cash flow stresses to properly analyze a bond. DBRS incorporates a dynamic cash flow analysis in our rating process. As indicated in the DBRS Base Cash Flow Scenarios table, a baseline of five prepayment scenarios (under two Intex conventions – Standard and Max⁴), two loss timing curves and two interest rate stresses are generally applied to test the resilience of a bond. An appropriate rating is one that can withstand the combination of DBRS-modeled cash flow stresses without the rated class incurring any interest shortfalls or principal writedowns. As warranted, transactions may be further stressed to include weighted average coupon (WAC) deterioration. DBRS generally runs 40 scenarios in each rating category to test the sensitivity of the rated securities to various cash flow stresses.

⁴. Standard: The standard prepayment rate consists of voluntary prepayments only. Prepayment amount and default amount are applied to the loans independently. Max: Intex will first apply the defaulted amount, then apply the prepayment amount such that the total amount applied is equal to the larger of the prepayment or the default amount.
Table 1: DBRS Base Cash Flow Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Prepayments</th>
<th>Intex Prepayment Convention</th>
<th>Loss Timing</th>
<th>Interest Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>5 - 25% CPR</td>
<td>Standard</td>
<td>Front-Loaded</td>
<td>Upward</td>
</tr>
<tr>
<td>6-10</td>
<td>5 - 25% CPR</td>
<td>Standard</td>
<td>Front-Loaded</td>
<td>Downward</td>
</tr>
<tr>
<td>11-15</td>
<td>5 - 25% CPR</td>
<td>Standard</td>
<td>Back-Loaded</td>
<td>Upward</td>
</tr>
<tr>
<td>16-20</td>
<td>5 - 25% CPR</td>
<td>Standard</td>
<td>Back-Loaded</td>
<td>Downward</td>
</tr>
<tr>
<td>21-25</td>
<td>5 - 25% CPR</td>
<td>Max</td>
<td>Front-Loaded</td>
<td>Upward</td>
</tr>
<tr>
<td>26-30</td>
<td>5 - 25% CPR</td>
<td>Max</td>
<td>Front-Loaded</td>
<td>Downward</td>
</tr>
<tr>
<td>31-35</td>
<td>5 - 25% CPR</td>
<td>Max</td>
<td>Back-Loaded</td>
<td>Upward</td>
</tr>
<tr>
<td>36-40</td>
<td>5 - 25% CPR</td>
<td>Max</td>
<td>Back-Loaded</td>
<td>Downward</td>
</tr>
</tbody>
</table>

* Where there is a mismatch between the collateral and bond coupons. Please refer to the Unified Interest Rate Model for U.S. RMBS Transactions for more detail of the interest rate stresses applied by DBRS.

Enhanced Cash Flow Analysis
Cash flow assumptions for liquidating trust securitizations and swap termination payments vary slightly due to the nature of their underlying mortgages. Cash flow for liquidating trusts, backed by mostly non-performing assets, focuses on the expected timing of liquidation proceeds for each delinquency bucket and such loss timing curves are intentionally back-loaded. Given the mostly delinquent underlying assets, DBRS also assumes 0% prepayment speed on liquidating trust transactions. For swap termination payments, DBRS stresses various cash flow assumptions to capture the minimum amount of collateral cash flow (on the asset side) and the maximum amount of the swap termination payments (on the liability side).

For transactions without servicing advances, DBRS typically terminates any cash flow from a loan as soon as it becomes delinquent. The recovery proceeds do not begin until such loan is liquidated, generally 24 to 30 months later. Sometimes such transactions maintain strictly separate interest and principal payment streams, and have capped the coupon of the rated class at the actual interest received. In such instances, DBRS may modify the cash flow assumptions for these types of transactions.

In the rare instance where cash flows are unavailable for the transaction, an alternative method may be utilized to assess whether the credit enhancement available is sufficient to sustain the projected losses in a given rating category. In the event that there is insufficient information for the analysis, DBRS may discontinue the rating.

Trigger Analysis
In a transaction with performance triggers, principal payments can switch between sequential and pro-rata distribution among the senior and the subordinate notes based on collateral performance. When analyzing cash flows, DBRS approximates a delinquency vector to test the impact of delinquency triggers.

SERVICING PRACTICES AND IMPACT TO REREMICS INTEREST PAYMENTS
Since a ReREMIC is a pass-through of interest, principal and losses from the underlying certificates, its interest entitlement is usually capped at the actual interest amount collected on the underlying securities. In other words, a ReREMIC trust cannot pay out more interest than it receives from its collateral, and sometimes, what is collected on the underlying securities can be as low as zero.

When rating ReREMICs, DBRS is assessing the ability of the trust to make the full principal payment by the legal final maturity date of the transaction. These transactions typically define the interest rate as the lesser of the bond coupon and the available interest funds. Hence, the DBRS rating does not provide an opinion on the timeliness or amount of interest payments the investor may receive. The trust’s only obligation is to pass through the interest proceeds net of fees from the underlying securities.
Continued deterioration in securitization performance has prompted changes in servicing practices that were not anticipated from the pre-crisis period. Loan modification, mostly in the form of interest rate reduction, was a loss mitigation technique meant only for a limited number of distressed borrowers, not as a solution to colossal defaults as it is today. In addition, large scale modifications often allowed servicers to recoup past servicing advances at the top of the waterfall, reducing the interest amount distributable to the bond holders. Finally, driven by the unprecedented level of delinquent mortgages and extension of foreclosure timelines, a declining trend in servicing advances has been observed and will most likely continue in the foreseeable future. Consequently, ReREMIC investors these days are more likely to experience lower interest receipts for reasons described above.


SURVEILLANCE ASSUMPTIONS

Macroeconomic conditions, prepayment speeds and liquidation timelines change with time and asset pools. RMBS Insight provides users with the option to forecast quantities of the variables listed below. When monitoring a transaction, these assumptions are generally based on actual observations and/or industry forecasts.

(1) Future changes in unemployment rates – by default, DBRS assumes no changes from the most recently observed regional unemployment rate.

(2) Future changes in house prices – by default, DBRS generally assumes no further stresses in house prices on top of its baseline peak-to-trough home price forecast and market value decline by rating category.

(3) Voluntary prepayment rate (CPR) – by default, DBRS assumes a transaction’s observed 12-month trailing CPR unless specified in this methodology.

(4) Future changes in liquidation timelines – by default, DBRS assumes no changes to the currently observed liquidation timeline.

(5) Future changes in months in real estate-owned (REO) properties – by default, DBRS assumes 6 months.

(6) Roll rates from 180 Days delinquency to default – by default, DBRS generally assumes 100% roll rate for seasoned pools and lower roll rates for recent vintage prime jumbo and agency pools.

Many of the seasoned transactions represent lax underwriting processes, weak policies and controls and inflated appraisals. A portion of these risks are manifested in deal performance over time, and are therefore captured through the seasoned characteristics by RMBS Insight. Additional haircuts/stresses on original appraisals (on top of property value indexing using Case-Schiller data on a MSA-level) and mortgage insurance may be warranted to address these risks on seasoned loans.

In some transactions, either the entire deal or a specific bond may have an explicit guarantee from an entity such as a Bond Insurer or Guarantor. In these cases, the rating of the entity will be taken into consideration when assessing the transaction or bond.

In addition, a small percentage of DBRS-rated transactions may be missing certain loan-level fields. Where possible, DBRS has made reasonable and conservative assumptions to enable the RMBS Insight model to run. For example, missing original appraisals may be derived from the original loan-to-value ratios, or missing zip codes may be defaulted to the region of the state that has had the largest decline in house

5. For transactions backed by loans with fewer than 12 months of prepayment history, DBRS uses the assumed CPR at the time of assigning a rating.
prices since the loan was originated. In the rare case that there is no loan-level information available, alternative procedures to project reasonable loss, default, and loss severity assumptions at each rating category may be utilized. For those transactions where only loan-level origination tapes are available, DBRS may use the Shadow Pool Methodology outlined in Appendix 1. In cases where the information available is insufficient, DBRS may discontinue the rating.

RMBS pools tend to exhibit “tail” risk or adverse selection as mortgages prepay or amortize, thus creating increased performance volatility for small pools over time. Such volatility and the inherent credit risk are difficult to ascertain by rating models. These days, when call options are not exercised as frequently as before, DBRS may withdraw ratings when the underlying pools reduce to a very small size (for example approximately 50 loans or fewer).

ANALYSIS OF CASH FLOW RESULTS
In order to maintain the appropriate ratings on securities, DBRS reviews the cash flow results. The review encompasses a check for errors (for instance, scenarios did not run properly) and for reasonability. DBRS may apply certain qualitative factors to the analysis such as changes in servicer, loss mitigation efforts or performance trends that may not have been accounted for in a typical cash flow analysis. The rating committee may either accept or modify the rating recommendation\(^6\) if the committee decides that adjustments are necessary to improve the risk assessment.

\(^6\) A material deviation from the rating implied by the model would be a three-notch or greater rating difference.
Appendix 1: Shadow Pool Methodology

SUMMARY
The purpose of this appendix is to describe the methodology for determining expected losses for outstanding U.S. RMBS transactions when updated loan-level information is not available to DBRS from either MBSData or Intex.

A shadow pool approach based on a ‘nearest neighbor’ methodology has been defined to handle the situation in which loan-level origination data is available, but current performance data is only available on a pool level basis. The philosophy of constructing the shadow pool is to leverage the analytics provided by the RMBS Insight model and the comprehensive MBSData dataset.

METHODOLOGY
Since the subject pool (or the target pool) does not have updated loan-level data, a shadow pool is created from similar loans with matching characteristics as a proxy for the target pool. The construction of the shadow pool is described in detail below.

The methodology needs the following input data:
• Loan-level data at origination (or transaction inception) – target pool
  (1) Product type.
  (2) First payment date.
  (3) Origination loan balance.
  (4) Appraisal value.
  (5) Property State and zip code.
• Pool-level data at the as-of-date (or date of review):
  (1) Current pool balance.
  (2) Percent of the balance that is: Current, 30 days, 60 days, 90+ days delinquent, foreclosure and REO.

Shadow Pool Construction
For each loan in the target pool, DBRS pulls similar loans (or “candidate” loans) from the MBSData database with matching characteristics. A distance metric is calculated to determine the “closeness” of each candidate loan to the target loan. Only the closest candidate loans are selected for each target loan.

For each target loan, DBRS then calculates the average delinquency of all selected candidate loans, a value called DQM. Each target loan has one DQM. The target pool is sorted by descending DQM, and as such, the target loans are arranged in the order from the most likely to default to the least likely to default.

Once the target loans are ordered, DBRS constructs a shadow pool by selecting the most relevant candidate loan for each target loan. The candidate loans are selected in the following sequence: REO, foreclosure, 90+ days delinquent, 60, 30 and current. For the first target loan in the pool (with the highest DQM), DBRS selects from its candidate loans an REO that has the lowest distance metric, i.e. the closest candidate to target loan #1 that is a REO. Another candidate REO closest to the second target loan is then chosen. One by one, the closest REO candidate for each target loan is selected until the necessary balance of REO is reached. Each target loan is removed from further consideration.
The selection process is then repeated, in turn, for the foreclosure, 90+ delinquent, 60, 30 and current buckets. The construction process is illustrated in Figure 2 below.

**Figure 2: Shadow Pool Construction**

<table>
<thead>
<tr>
<th>Target Loan (Sorted by DQM)</th>
<th>Candidate Loan</th>
<th>DQM (Likelihood to default)</th>
<th>Candidate Loan Selected</th>
<th>Until</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 2, 3....300</td>
<td>Highest</td>
<td>A REO with the lowest distance metric to target loan #1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A REO with the lowest distance metric to target loan #2</td>
<td>REO balance reached</td>
</tr>
<tr>
<td>3</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A REO with the lowest distance metric to target loan #3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A REO with the lowest distance metric to target loan #4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A REO with the lowest distance metric to target loan #5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A foreclosure loan with the lowest distance metric to target loan #12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 90+ loan with the lowest distance metric to target loan #13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 90+ loan with the lowest distance metric to target loan #14</td>
<td>90+ balance reached</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 60+ loan with the lowest distance metric to target loan #100</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 60+ loan with the lowest distance metric to target loan #101</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
<td>...</td>
<td>60+ balance reached</td>
</tr>
<tr>
<td>300</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 30+ loan with the lowest distance metric to target loan #300</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A 30+ loan with the lowest distance metric to target loan #301</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
<td>...</td>
<td>30+ balance reached</td>
</tr>
<tr>
<td>500</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A current loan with the lowest distance metric to target loan #500</td>
<td></td>
</tr>
<tr>
<td>501</td>
<td>1, 2, 3....300</td>
<td></td>
<td>A current loan with the lowest distance metric to target loan #501</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
<td>...</td>
<td>Current balance reached</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>Lowest</td>
<td>...</td>
<td>Discard the rest of the target pool</td>
</tr>
</tbody>
</table>
This orders the dataset in such a way so that the ‘riskiest’ target loans tend to be used up first, leaving better loans for the better buckets which results in a more conservative process.

The loans in the shadow pool are then used as the collateral file for input to the loan-level RMBS Insight model. This process works well because the key variables in RMBS Insight for seasoned loans drive the construction of the shadow pool. Such key variables are: current delinquency status, current/future equity/LTV, product type, payment histories and FICO scores, DBRS designs the shadow pool to match the target population on all of these key variables.

**Evaluation of the Shadow Pool Methodology**

The method is evaluated by selecting deals from the MBSData dataset, creating a shadow pool and then comparing the forecasts for the shadow pool and the target pool.

The following types of transactions are identified from the MBSData dataset:
- Prime
- Alt-A
- Subprime
- Non-performing loans
- Option ARM
- Second lien

The deals are further filtered based on:
- Deals issued in 2004 and later.
- Sufficient data to employ RMBS Insight.

Target deals are randomly selected from each sort. None of the target pool loans are allowed to enter the shadow pool. As a starting point, DBRS looked at how well the shadow portfolio matches the target portfolio on both the origination characteristics and the current delinquency status. The match is exceptionally good.

Subsequently, DBRS ran both the target pools and the shadow pools to derive expected loss rates. The loss rates on the target pools and shadow pools correlate very well across the ratings spectrum. Table 2 and Table 3 below show the comparisons by rating category and by loan type.

**Table 2: Average Loss Rate by Rating Category**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Loss Rate Correlation</th>
<th>Average Loss Rate Target</th>
<th>Average Loss Rate Shadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>97.0%</td>
<td>77.3%</td>
<td>78.0%</td>
</tr>
<tr>
<td>AA</td>
<td>96.9%</td>
<td>72.5%</td>
<td>73.1%</td>
</tr>
<tr>
<td>A</td>
<td>96.9%</td>
<td>67.6%</td>
<td>68.1%</td>
</tr>
<tr>
<td>BBB</td>
<td>96.9%</td>
<td>62.5%</td>
<td>63.0%</td>
</tr>
<tr>
<td>BB</td>
<td>96.8%</td>
<td>56.9%</td>
<td>57.4%</td>
</tr>
<tr>
<td>B</td>
<td>96.4%</td>
<td>50.9%</td>
<td>51.5%</td>
</tr>
</tbody>
</table>
Table 3: Average Loss Rate by Loan Type

<table>
<thead>
<tr>
<th>Loan Type</th>
<th>Target</th>
<th>Shadow</th>
<th>Target</th>
<th>Shadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime</td>
<td>31%</td>
<td>35%</td>
<td>56%</td>
<td>60%</td>
</tr>
<tr>
<td>Alt-A</td>
<td>50%</td>
<td>50%</td>
<td>76%</td>
<td>76%</td>
</tr>
<tr>
<td>Subprime</td>
<td>60%</td>
<td>59%</td>
<td>86%</td>
<td>86%</td>
</tr>
<tr>
<td>NPL</td>
<td>60%</td>
<td>61%</td>
<td>86%</td>
<td>87%</td>
</tr>
<tr>
<td>Option ARM</td>
<td>56%</td>
<td>57%</td>
<td>81%</td>
<td>82%</td>
</tr>
<tr>
<td>Seconds</td>
<td>55%</td>
<td>54%</td>
<td>84%</td>
<td>81%</td>
</tr>
<tr>
<td>Total</td>
<td>50%</td>
<td>52%</td>
<td>76%</td>
<td>77%</td>
</tr>
</tbody>
</table>

Figure 3 below exhibits loss rates comparisons between the target and the shadow pools for each of the selected transactions. The more pronounced deviations are from second lien transactions with expected loss rates exceeding 60%.
Conclusion
The evaluation indicates that second liens show slightly more volatility between the target and shadow pools. To address this, DBRS applies a factor of 1.1 to all second lien deals (if the shadow pool methodology is used) with base case expected losses over 60%.

Overall the shadow pool methodology works very well on mortgages across all segments examined. It also allows DBRS to leverage the analytics provided by the RMBS Insight model and the comprehensive MBSData dataset.