Data Dynamics™ Tutorial: 
HARP Performance Data Addendum to 
Fannie Mae’s Historical Single-Family 
Loan Performance Dataset 
August 2017
Data Dynamics: Report Menu

- We have added new buttons highlighted below for users to access the HARP Enhanced Analysis for both the Historical Comparative Analysis and Historical Performance Data Dashboard.
### Historical Performance: Historical Performance Data Dashboard with HARP Enhanced Analysis

- The “Origination Profile” tab within the Historical Performance Data Dashboard allows users to toggle the dataset to view different loan populations, displaying the characteristics of the original loan in each view, including:
  - **Full population** – All loans included in the primary dataset
  - **Loans not resulting in HARP** – Includes only loans that were not refinanced through HARP (i.e., may have prepaid, had another terminal outcome, or are still included in dataset)
  - **Loans resulting in HARP** – Includes only loans that were refinanced through HARP

Click on “Show Glossary” to examine our newly defined terms for this tab.

To note, users will be able to pick a new Cohort filter called “HARP Year” to view by the year that the HARP mortgage note was issued.

---

<table>
<thead>
<tr>
<th>Origination Profile by Origination Vintage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan Population</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Full population</td>
</tr>
</tbody>
</table>

### Historical Performance Data with HARP

#### Historical Performance Data

<table>
<thead>
<tr>
<th>FICO</th>
<th>OCLTV</th>
<th>Risk Layers</th>
<th>No. of Borrowers</th>
<th>Occupancy</th>
<th>Purpose</th>
<th>DTH</th>
<th>Original Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- For loans resulting in a HARP refinance, this profile displays characteristics of the original loan before the refinance.
- Collected by Origination Vintage.
- Visit: All FICO, All OCLTV, All Risk Layers, All Occupancy, All Purpose, All No. of Borrowers.

© 2017 Fannie Mae. Trademarks of Fannie Mae.
Historical Performance: Historical Performance Data Dashboard with HARP Enhanced Analysis

- The “Historical Performance” tab within the Historical Performance Data Dashboard allows users to toggle the dataset to view different loan populations, displaying the characteristics of the original loan in each view. In addition, it allows users to toggle the dataset between the following two features under HARP Performance Treatment:

1. **HARP activity appended** – For loans that have refinanced under HARP, this feature appends to the original loan activity record the performance activity of the corresponding new loan after the associated HARP refinance.

2. **HARP treated as prepay** – For loans that have refinanced under HARP, this feature treats the loan as a repayment (zero balance code = ‘01’). Note: this treatment is equivalent to the loan performance in the primary data set.

---

### Historical Performance Data with HARP

<table>
<thead>
<tr>
<th>Historical Performance Data by Origination Vintage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HARP Performance Treatment</strong></td>
</tr>
<tr>
<td>HARP treated as prepay</td>
</tr>
</tbody>
</table>

#### Historical Performance Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Orig UPB ($)</th>
<th>% Active</th>
<th>% Prepay</th>
<th>% Repurchase</th>
<th>% TPS</th>
<th>% Short Sale</th>
<th>% REC</th>
<th>% NPL</th>
<th>% Modified</th>
<th>% HARP</th>
<th>% D100</th>
<th>Net Loss Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>$17.94</td>
<td>0.02%</td>
<td>02.21%</td>
<td>0.20%</td>
<td>0.14%</td>
<td>0.07%</td>
<td>0.75%</td>
<td>0.00%</td>
<td>0.55%</td>
<td>0.03%</td>
<td>1.85%</td>
<td>0.14%</td>
</tr>
<tr>
<td>2000</td>
<td>$14.02</td>
<td>0.42%</td>
<td>05.61%</td>
<td>0.12%</td>
<td>0.10%</td>
<td>0.06%</td>
<td>0.74%</td>
<td>0.00%</td>
<td>0.40%</td>
<td>0.03%</td>
<td>1.61%</td>
<td>0.16%</td>
</tr>
<tr>
<td>2001</td>
<td>$340.08</td>
<td>0.94%</td>
<td>03.71%</td>
<td>0.11%</td>
<td>0.09%</td>
<td>0.07%</td>
<td>0.73%</td>
<td>0.00%</td>
<td>0.57%</td>
<td>0.15%</td>
<td>1.48%</td>
<td>0.22%</td>
</tr>
<tr>
<td>2002</td>
<td>$374.43</td>
<td>2.00%</td>
<td>09.59%</td>
<td>0.11%</td>
<td>0.10%</td>
<td>0.09%</td>
<td>0.80%</td>
<td>0.02%</td>
<td>0.78%</td>
<td>0.04%</td>
<td>1.74%</td>
<td>0.31%</td>
</tr>
<tr>
<td>2003</td>
<td>$697.03</td>
<td>5.14%</td>
<td>01.41%</td>
<td>0.13%</td>
<td>0.15%</td>
<td>0.10%</td>
<td>0.89%</td>
<td>0.05%</td>
<td>1.40%</td>
<td>2.07%</td>
<td>2.89%</td>
<td>0.48%</td>
</tr>
<tr>
<td>2004</td>
<td>$200.02</td>
<td>6.93%</td>
<td>07.78%</td>
<td>0.18%</td>
<td>0.25%</td>
<td>0.04%</td>
<td>0.21%</td>
<td>0.09%</td>
<td>2.79%</td>
<td>5.19%</td>
<td>5.11%</td>
<td>1.06%</td>
</tr>
<tr>
<td>2005</td>
<td>$203.34</td>
<td>8.76%</td>
<td>07.46%</td>
<td>0.25%</td>
<td>0.37%</td>
<td>0.16%</td>
<td>0.96%</td>
<td>0.14%</td>
<td>5.18%</td>
<td>12.56%</td>
<td>9.22%</td>
<td>2.53%</td>
</tr>
<tr>
<td>2006</td>
<td>$172.37</td>
<td>8.23%</td>
<td>07.43%</td>
<td>0.44%</td>
<td>0.35%</td>
<td>0.18%</td>
<td>2.59%</td>
<td>0.18%</td>
<td>7.34%</td>
<td>17.42%</td>
<td>12.44%</td>
<td>3.12%</td>
</tr>
<tr>
<td>2007</td>
<td>$517.97</td>
<td>9.37%</td>
<td>04.48%</td>
<td>0.90%</td>
<td>0.34%</td>
<td>0.26%</td>
<td>5.64%</td>
<td>0.02%</td>
<td>8.00%</td>
<td>22.57%</td>
<td>14.33%</td>
<td>3.60%</td>
</tr>
<tr>
<td>2008</td>
<td>$502.72</td>
<td>7.33%</td>
<td>81.77%</td>
<td>0.81%</td>
<td>0.17%</td>
<td>1.28%</td>
<td>2.58%</td>
<td>0.10%</td>
<td>5.34%</td>
<td>23.54%</td>
<td>7.07%</td>
<td>1.43%</td>
</tr>
<tr>
<td>2009</td>
<td>$417.03</td>
<td>13.52%</td>
<td>70.39%</td>
<td>0.40%</td>
<td>0.34%</td>
<td>0.04%</td>
<td>0.40%</td>
<td>0.03%</td>
<td>0.72%</td>
<td>5.25%</td>
<td>1.27%</td>
<td>0.17%</td>
</tr>
<tr>
<td>2010</td>
<td>$295.10</td>
<td>21.17%</td>
<td>09.66%</td>
<td>0.08%</td>
<td>0.05%</td>
<td>0.09%</td>
<td>0.15%</td>
<td>0.01%</td>
<td>0.33%</td>
<td>0.57%</td>
<td>0.05%</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>$235.28</td>
<td>28.70%</td>
<td>03.31%</td>
<td>0.04%</td>
<td>0.01%</td>
<td>0.02%</td>
<td>0.09%</td>
<td>0.01%</td>
<td>0.25%</td>
<td>0.44%</td>
<td>0.02%</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>$417.04</td>
<td>15.10%</td>
<td>34.04%</td>
<td>0.05%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.04%</td>
<td>0.01%</td>
<td>0.14%</td>
<td>0.24%</td>
<td>0.01%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>$388.28</td>
<td>16.26%</td>
<td>32.73%</td>
<td>0.11%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.04%</td>
<td>0.01%</td>
<td>0.17%</td>
<td>0.28%</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>$246.78</td>
<td>27.69%</td>
<td>37.62%</td>
<td>0.11%</td>
<td>0.11%</td>
<td>0.01%</td>
<td>0.17%</td>
<td>0.01%</td>
<td>0.32%</td>
<td>0.00%</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>$332.87</td>
<td>76.06%</td>
<td>17.17%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.04%</td>
<td>0.12%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>$139.58</td>
<td>60.36%</td>
<td>7.39%</td>
<td>0.04%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.03%</td>
<td>0.00%</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>$4,890.71</td>
<td>26.34%</td>
<td>64.22%</td>
<td>0.20%</td>
<td>0.10%</td>
<td>0.42%</td>
<td>1.14%</td>
<td>0.04%</td>
<td>1.50%</td>
<td>4.36%</td>
<td>2.62%</td>
<td>0.84%</td>
</tr>
</tbody>
</table>
The “Loss/Severity Summary” tab within Historical Performance Data Dashboard allows users to toggle the dataset to view different loan populations, displaying the characteristics of the original loan in each view. In addition, it allows users to toggle the dataset between the two features under HARP Performance Treatment.

Overall, this table shows all costs and proceeds considered in calculating net loss and severity in dollar and percentage terms. The values highlighted in orange are expenses to Fannie Mae, and the values highlighted in green are proceeds to Fannie Mae.
The “Relative Performance” tab within the Historical Performance Data Dashboard allows users to toggle the dataset to view different loan populations, displaying the characteristics of the original loan in each view. In addition, it allows users to toggle the dataset between the two features under HARP Performance Treatment.

This table shows the event rate selected using the “Select Event” dropdown across origination vintage and selected cohort. We have added HARP as one of the dropdown selections in the “Select Event” category.
Historical Performance: Historical Performance Data Dashboard with HARP Enhanced Analysis

- The “HARP Profile” tab within the Historical Performance Data Dashboard is limited to the population of loans resulting in a HARP refinance, and shows characteristics of both the original loan before the refinance, and characteristics updated for the new loan.

We added new columns, such as HARP UPB, Average HARP UPB, HARP Borrower Credit Score, HARP Co-Borrower Credit Score, HARP LTV Ratio, HARP CLTV Ratio, and HARP Interest Rate. All of these terms have been defined on our glossary that is provided to users when the “Show Glossary” button is selected.
Connecticut Avenue Securities™ (CAS): Historical Comparative Analysis with HARP Enhanced Analysis

- The “Across Years Graph” tab within CAS’s Historical Comparative Analysis with HARP Enhanced Analysis reflects historical loss performance re-weighted to the CAS deal profile across FICO, CLTV, and risk layer distribution. Tranche attachment points, represented as horizontal lines, bring the magnitude of comped loss into perspective.

We added the component of the Harp Loss Rate to the comparative analysis graph for actual loss deals. HARP Loss Rate is defined as the losses associated with mortgages that default after they have been refinanced through HARP. Because HARP loans are treated as prepayments in the primary data set, their losses are not included in the original Net Loss Rate. This total loss amount includes pipeline and modification loss amounts for loans that have experienced HARP.
Credit Insurance Risk Transfer™ (CIRT™): Historical Comparative Analysis with HARP Enhanced Analysis

- The “Across Years Graph” tab within CIRT’s Historical Comparative Analysis with HARP Enhanced Analysis reflect historical loss performance re-weighted to the CIRT deal profile across FICO, CLTV, and Risk layer distribution. Tranche attachment points, represented as horizontal lines, bring the magnitude of comped loss into perspective.

We added the component of the Harp Loss Rate to the comparative analysis. HARP Loss Rate is defined as the losses associated with mortgages that default after they have been refinanced through HARP. Because HARP loans are treated as prepayments in the primary data set, their losses are not included in the original Net Loss Rate. This total loss amount includes pipeline loss amounts for loans that have experienced HARP.
Additional resources

Online content:

Credit risk sharing webpage:

Fannie Mae’s loan performance analytics tool, Data Dynamics:
www.fanniemae.com/datadynamics

Fannie Mae’s detailed approach to single family credit risk management:

Fannie Mae single-family loan performance data:
http://fanniemae.com/loanperformance

Contact Information:
Credit Securities:
Credit_securities@Fanniemae.com
1-800-2Fannie, Option 2

Laurel Davis
Vice President for Credit Risk Transfer
laurel_davis@fanniemae.com
202.752.8309

Bob Ives
Vice President and Head of Retained Portfolio
robert_ives@fanniemae.com
202.752.3340

Nick Sapirie
Director, Single-Family Analytics
nicholas_sapirie@fanniemae.com
202.752.5151

Dennis Crosson
Director, Credit Risk Transfer
dennis_j_crosson@fanniemae.com
202.752.6567

Kathleen Pagliaro
Director, Credit Risk Transfer
kathleen_pagliaro@fanniemae.com
202.752.1811

Thomas Jones
Senior Transaction Manager, Credit Risk Transfer
thomas_jones@fanniemae.com
202.752.6085

Manish Borkar
Financial Engineer Manager, Single-Family Analytics
Manish_borkar@fanniemae.com
202.752.6384

Doug Votroubek
Investor Outreach
douglas_o_votroubek@fanniemae.com
202.752.3121

Sonja Beaubien
Director, Fixed Income Marketing
sonja_beaubien@fanniemae.com
202.752.8290

Eri Furukawa
Marketing Strategist, Fixed Income Marketing
eri_furukawa@fanniemae.com
202.752.1808

Mike McCarthy
Analyst, Fixed Income Marketing
michael_c_mccarthy@fanniemae.com
202.752.8376
The materials contained in this presentation have been prepared by Fannie Mae for informational purposes only. For the avoidance of doubt, this document shall not constitute an offer to sell securities or a solicitation of an offer to buy securities or to obligate Fannie Mae to issue any securities. This presentation may include "forward-looking statements" within the meaning of the safe harbor provisions of the United States Private Securities Litigation Reform Act of 1995. Actual results may differ from expectations, estimates and projections and, consequently, readers should not rely on these forward-looking statements as predictions of future events. Words such as "expect," "target," "assume," "estimate," "project," "budget," "forecast," "anticipate," "intend," "plan," "may," "will," "could," "should," "believe," "predicts," "potential," "continue," and similar expressions are intended to identify such forward-looking statements. These forward-looking statements involve significant risks and uncertainties that could cause actual results to differ materially from expected results. Factors that could cause actual results to differ include, but are not limited to, higher than expected operating costs, rates of default on the referenced mortgages, changes in interest rates or the availability of financing, the impact of new legislation or regulatory changes on our operations, the impact of any deficiencies in the servicing practices of third parties and anticipated changes in overall market and economic conditions. Readers are cautioned not to place undue reliance upon any forward-looking statements, which speak only as of the date made. Fannie Mae does not undertake or accept any obligation to release publicly any updates or revisions to any forward-looking statement to reflect any change in its expectations or any change in events, conditions or circumstances on which any such statement is based. Additional information concerning these and other risk factors is contained in our most recent Form 10-k and Form 10-Q filings with the Securities and Exchange Commission, copies of which are available on our website at www.fanniemae.com. All subsequent written and oral forward looking statements concerning Fannie Mae or the matters discussed in these materials are expressly qualified in their entirety by the cautionary statements above.

THIS DOCUMENT DOES NOT DISCLOSE ALL THE RISKS AND OTHER SIGNIFICANT ISSUES RELATED TO AN INVESTMENT IN THE SECURITIES. PRIOR TO INVESTING IN THE SECURITIES, POTENTIAL INVESTORS SHOULD READ THE FINAL PROSPECTUS ISSUED BY FANNIE MAE RELATING TO THE SECURITIES AND ENSURE THAT THEY FULLY UNDERSTAND THE TERMS OF THE SECURITIES AND ANY APPLICABLE RISKS.