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.

Historical Performance Data with HARP

Origination Profile | Historical Performance | Loss/Severity Summary | Relative Performance | HARP Profile

Historical Performance Data

Origination Profile by Origination Vintage

Loan Population: Full population
Cohort: Origination Vintage

Origination Vintage: (All) | FICO: (All) | OCLTV: (All) | Risk Layers: (All) | No. of Borrowers: (All) | Occupancy: (All) | Purpose: (All)

	Loan Count	Total Origination UPB ($M)	Average Origination UPB ($)	Borrower Credit Score	Co-Borrower Credit Score	LTV Ratio	CLTV Ratio	DTI	Original Interest Rate
1999	127,089	$15,941	$125,432	716	724	79.4%	79.5%	34.9%	7.80%
2000	1,069,662	$140,915	$131,738	718	726	79.1%	79.3%	35.7%	8.13%
2001	2,346,139	$349,665	$149,038	719	726	75.4%	75.8%	34.0%	6.99%
2002	2,389,975	$374,434	$156,669	723	730	72.9%	73.4%	34.0%	6.50%
2003	3,008,543	$497,025	$165,205	725	732	70.8%	71.5%	33.5%	5.75%
2004	1,192,469	$200,816	$168,403	721	728	72.1%	73.7%	36.6%	5.84%
2005	1,130,565	$208,337	$184,277	725	732	71.2%	73.3%	38.2%	5.84%
2006	893,982	$172,371	$192,812	724	732	71.7%	73.9%	39.3%	6.42%
2007	1,062,676	$217,870	$205,020	724	732	73.4%	75.5%	39.4%	6.36%
2008	1,181,103	$262,724	$222,440	744	752	73.4%	75.0%	38.5%	6.04%
2009	1,756,009	$417,033	$237,489	764	770	67.9%	69.4%	34.2%	4.96%
2010	1,198,203	$295,102	$246,287	768	774	69.5%	71.0%	32.8%	4.72%
2011	1,002,801	$235,278	$234,621	767	774	71.6%	73.0%	33.1%	4.55%
2012	1,711,268	$417,945	$244,231	770	775	71.6%	72.9%	31.9%	3.84%
2013	1,523,021	$356,249	$233,909	762	768	75.2%	76.3%	33.4%	4.05%
2014	1,089,768	$246,777	$226,449	752	758	78.6%	79.5%	34.8%	4.46%
2015	1,400,408	$332,673	$237,554	754	760	77.4%	78.2%	34.3%	4.13%
2016	574,349	$139,555	$242,979	753	759	77.2%	77.9%	34.4%	4.03%
Grand Total	24,658,030	$4,880,708	$197,936	744	752	73.0%	74.2%	34.7%	5.35%

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

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

Origination Profile | Historical Performance | Loss/Severity Summary | Relative Performance | HARP Profile

Fannie Mae

Historical Performance Data

Historical Performance by Origination Vintage

HARP Performance Treatment: ● HARP treated as prepay ○ HARP activity appended
Loan Population: Full population

Cohort: Origination Vintage
Display: % of Orig UPB

Origination Vintage: (All) | FICO: (All) | OCLTV: (All) | Risk Layers: (All) | No. of Borrowers: (All) | Occupancy: (All) | Purpose: (All)

	Total Orig. UPB ($B)	% Active	% Prepay	% Repurchase	% TPS	% Short Sale	% REO	% NPL	% Modified	% HARP	% D180	Net Loss Rate
1999	$15.94	0.69%	93.21%	0.29%	0.14%	0.07%	0.75%	0.00%	0.58%	0.03%	1.85%	0.14%
2000	$140.92	0.45%	95.61%	0.18%	0.10%	0.06%	0.74%	0.00%	0.49%	0.03%	1.51%	0.16%
2001	$349.66	0.94%	93.71%	0.11%	0.09%	0.07%	0.73%	0.01%	0.57%	0.18%	1.46%	0.22%
2002	$374.43	2.05%	90.59%	0.11%	0.10%	0.09%	0.80%	0.02%	0.78%	0.64%	1.74%	0.31%
2003	$497.03	5.14%	81.41%	0.13%	0.18%	0.19%	1.09%	0.05%	1.49%	2.07%	2.89%	0.48%
2004	$200.82	6.93%	78.78%	0.18%	0.25%	0.54%	2.01%	0.09%	2.79%	5.19%	5.11%	1.06%
2005	$208.34	8.78%	74.05%	0.25%	0.37%	1.64%	3.82%	0.14%	5.18%	12.56%	9.22%	2.53%
2006	$172.37	8.20%	75.43%	0.41%	0.36%	2.46%	5.28%	0.18%	7.34%	17.42%	12.44%	3.82%
2007	$217.87	9.37%	74.48%	0.90%	0.34%	2.60%	5.64%	0.20%	9.00%	22.57%	14.33%	3.60%
2008	$262.72	7.33%	81.77%	0.81%	0.17%	1.28%	2.86%	0.10%	5.34%	23.54%	7.97%	1.43%
2009	$417.03	13.52%	76.39%	0.13%	0.04%	0.17%	0.40%	0.03%	0.72%	5.25%	1.27%	0.17%
2010	$295.10	21.17%	69.95%	0.08%	0.02%	0.05%	0.15%	0.01%	0.33%		0.57%	0.05%
2011	$235.28	28.70%	63.31%	0.04%	0.01%	0.02%	0.09%	0.01%	0.28%		0.44%	0.02%
2012	$417.94	56.19%	34.04%	0.05%	0.01%	0.01%	0.04%	0.00%	0.14%		0.24%	0.01%
2013	$356.25	59.28%	32.73%	0.18%	0.01%	0.01%	0.04%	0.00%	0.17%		0.28%	0.00%
2014	$246.78	57.06%	37.92%	0.17%	0.01%	0.01%	0.03%	0.00%	0.17%		0.30%	0.00%
2015	$332.67	79.09%	17.17%	0.09%	0.00%	0.00%	0.01%	0.00%	0.04%		0.12%	0.00%
2016	$139.55	90.39%	7.39%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%		0.03%	0.00%
Grand Total	$4,880.71	26.34%	64.22%	0.20%	0.10%	0.42%	1.14%	0.04%	1.68%	4.36%	2.92%	0.64%

Historical Performance: Historical Performance Data Dashboard with HARP Enhanced Analysis

- 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.

Historical Performance Data with HARP

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Origination Profile | Historical Performance | Loss/Severity Summary | Relative Performance | HARP Profile

Fannie Mae

Historical Performance Data

Loss/Severity Summary by Origination Vintage

HARP Performance Treatment
- ● HARP treated as prepay
- ○ HARP activity appended

Loan Population: Full population

Cohort: Origination Vintage   Rate/Amount: $ Amount

Origination Vintage	Disp Vintage	FICO	OCLTV	Risk Layers	No. of Borrowers	Occupancy	Purpose	Repurchase	Disposition Type
(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)

Cohort	Default UPB	Foreclosure	Property Preservation	Asset Recovery	Misc.	Taxes	Forgone Interest	Net Sales	Credit Enhancement	Repurchase / Make Whole	Other Proceeds	Net Loss/ Severity
1999	$152	$6.4	$4.8	$0.5	$0.9	$3.5	$17.8	$124.9	$22.9	$10.1	$6.7	$21.6
2000	$1263	$56.7	$41.5	$5.3	$8.3	$28.9	$158.1	$976.9	$199.2	$104.6	$56.9	$223.8
2001	$3080	$132.5	$107.7	$13.3	$22.0	$80.0	$345.6	$2308.0	$405.6	$159.2	$142.3	$766.0
2002	$3710	$161.9	$138.1	$19.6	$33.9	$113.0	$418.3	$2740.6	$419.7	$151.9	$139.0	$1143.2
2003	$7340	$289.7	$266.4	$41.2	$75.7	$250.9	$779.9	$5739.2	$590.7	$119.1	$207.8	$2387.3
2004	$5675	$204.1	$182.9	$33.1	$64.0	$184.5	$621.8	$4208.3	$420.2	$81.9	$117.4	$2137.9
2005	$12215	$337.7	$315.4	$64.9	$121.0	$307.5	$1277.8	$8268.7	$657.0	$284.0	$151.3	$5278.3
2006	$13994	$361.3	$328.8	$71.4	$134.6	$323.3	$1587.8	$8713.5	$735.9	$610.9	$163.2	$6577.2
2007	$18688	$467.1	$425.7	$96.9	$182.0	$435.5	$2117.0	$11473.8	$1516.6	$1339.5	$239.2	$7842.8
2008	$11274	$276.8	$255.9	$61.2	$97.5	$272.7	$1213.7	$7339.4	$1068.8	$1156.0	$143.2	$3744.2
2009	$2492	$59.0	$67.1	$13.4	$15.2	$59.9	$210.5	$1930.3	$109.9	$148.2	$29.0	$699.8
2010	$592	$16.9	$19.7	$3.7	$3.7	$14.7	$46.1	$489.4	$31.3	$21.1	$8.2	$146.7
2011	$251	$7.6	$9.2	$1.5	$1.6	$5.9	$18.1	$210.5	$20.6	$5.3	$2.6	$56.1
2012	$180	$5.5	$6.8	$1.0	$1.1	$3.9	$10.0	$152.4	$18.0	$1.6	$3.6	$32.3
2013	$135	$3.8	$4.6	$0.7	$0.8	$2.4	$7.0	$113.4	$21.3	$0.8	$2.1	$16.8
2014	$54	$1.2	$1.4	$0.3	$0.2	$0.8	$2.7	$45.4	$7.8	$0.2	$1.1	$5.6
2015	$13	$0.2	$0.1	$0.1	$0.0	$0.1	$0.4	$11.1	$1.7	$0.0	$0.5	$0.9
2016	$0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0

Displaying: $ Amount Cohorted by: Origination Vintage
Disp Type: All Disp Vintage: All Vintage: All FICO: All OCLTV: All Risk Layers: All Occupancy: All Purpose: All No. of Borrowers: All
*All dollar amounts above are stated in millions.

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.

Historical Performance: Historical Performance Data Dashboard with HARP Enhanced Analysis

- 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.

Historical Performance Data with HARP — Show Glossary

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Origination Profile | Historical Performance | Loss/Severity Summary | Relative Performance | **HARP Profile**

Fannie Mae — **Historical Performance Data**

HARP Profile by Origination Vintage

| Cohort	Origination Vintage	OCLTV	Risk Layers	No. of Borrowers	Purpose	Occupancy	FICO
Origination Vintage	(All)	(All)	(All)	(All)	(All)	(All)	(All)

HARP Profile

	Loan Count	Total Origination UPB ($M)	HARP UPB ($M)	Average Origination UPB ($)	Average HARP UPB ($)	Borrower Credit Score	HARP Borrower Credit Score	Co-Borrower Credit Score	HARP Co-Borrower Credit Score	LTV Ratio	HARP LTV Ratio	CLTV Ratio	HARP CLTV Ratio	Original Interest Rate	HARP Interest Rate
1999	52	$5M	$4M	$104,615	$86,365	702	703	709	687	86.9%	94.3%	86.9%	101.8%	7.82%	4.37%
2000	527	$50M	$43M	$95,116	$82,391	687	700	681	696	86.6%	97.0%	86.6%	100.5%	8.15%	4.25%
2001	6,273	$739M	$629M	$117,785	$100,288	704	726	710	728	84.4%	96.8%	84.5%	103.4%	6.90%	4.31%
2002	19,958	$2,782M	$2,394M	$139,385	$119,976	718	741	723	743	82.2%	95.6%	82.5%	103.8%	6.32%	4.27%
2003	71,162	$11,978M	$10,298M	$168,343	$144,733	722	746	727	750	80.9%	95.1%	81.4%	105.1%	5.74%	4.17%
2004	62,431	$11,790M	$10,430M	$188,845	$167,069	722	744	727	747	79.3%	98.4%	80.7%	107.2%	5.85%	4.23%
2005	134,843	$28,910M	$26,159M	$214,399	$193,999	726	741	730	745	76.4%	103.2%	78.4%	110.4%	5.85%	4.28%
2006	147,657	$32,036M	$30,029M	$216,963	$203,369	724	734	728	738	76.5%	105.6%	78.7%	110.4%	6.39%	4.50%
2007	230,779	$51,466M	$49,167M	$223,008	$213,048	723	731	727	736	78.7%	103.7%	80.8%	106.9%	6.34%	4.54%
2008	270,951	$63,918M	$61,851M	$235,902	$228,274	744	746	748	751	80.8%	98.0%	81.8%	99.4%	6.05%	4.51%
2009	90,865	$23,021M	$21,905M	$253,359	$241,073	761	765	765	769	78.9%	92.7%	79.7%	94.0%	4.99%	3.96%
Grand Total	1,035,488	$226,695M	$212,911M	$218,926	$205,614	733	742	738	747	78.9%	100.3%	80.4%	104.2%	6.01%	4.40%

# 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.
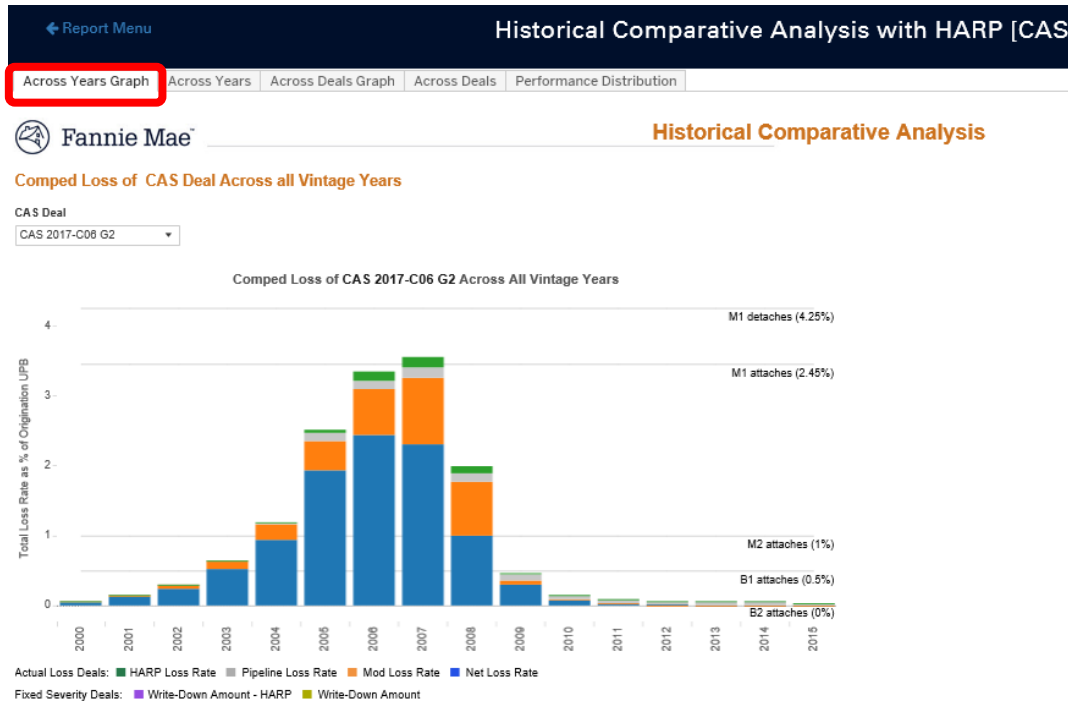
Credit Insurance Risk Transfer™ (CIRT™): Historical Comparative Analysis with HARP Enhanced Analysis

- 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.
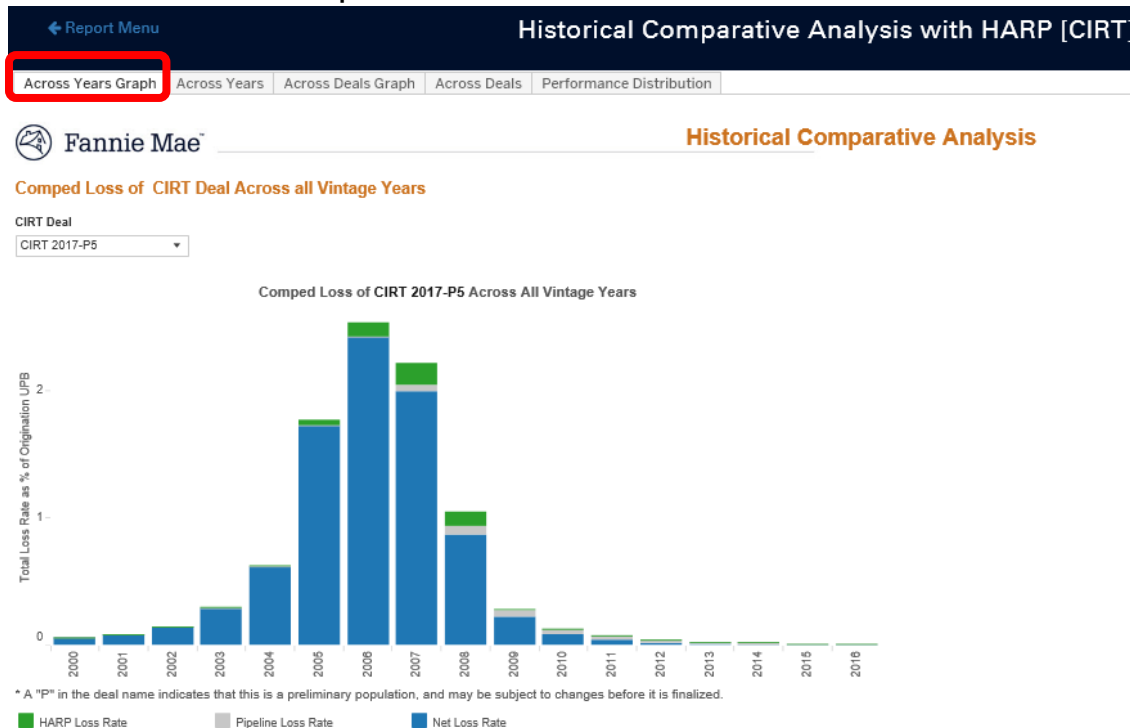
Additional resources

Contact information

Online content:

Credit risk sharing webpage:

http://fanniemae.com/portal/funding-the-market/credit-risk/index.html

Fannie Mae's loan performance analytics tool, Data Dynamics:

www.fanniemae.com/datadynamics

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

http://fanniemae.com/resources/file/credit-risk/pdf/0915-credit-risk-mgt-deck.pdf

Fannie Mae single-family loan performance data:

http://fanniemae.com/loanperformance

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