

Does Temporary Mortgage Assistance for Unemployed Homeowners Reduce Longer-Term Mortgage Default? Analysis of the Hardest Hit Fund Program

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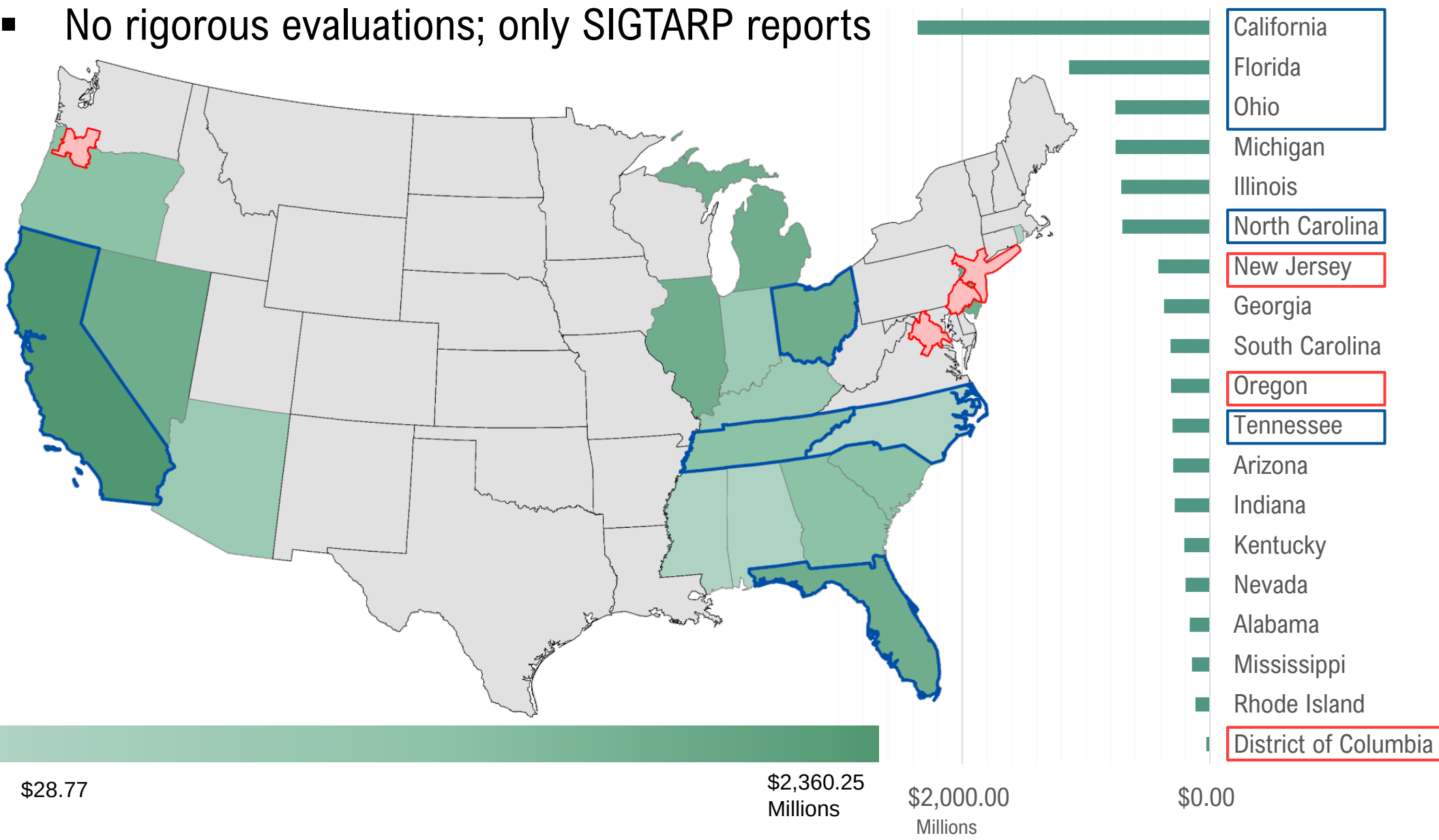
Background

The U.S. Department of Treasury spent \$37.4 billion in mortgage loss mitigation programs from 2009 through 2016. Much of these expenditures went toward traditional loan modification programs, such as HAMP.

- Lower interest rate, extend loan term, increase or decrease principal balance; often short term, require delinquency
- Modified **10% of loans** for 60+ delinquent homeowners' between 2005 and 2011; half re-defaulted within 6 months (Adelino et al., 2013).
- More effective: **principal reductions** (Goodman et al., 2011); **monthly payment reductions** (Voicu et al. 2012; Haughwout, Okah, and Tracy, 2016; Calem et al 2018)

In 2010, the U.S. Department of Treasury announced the \$9.6 billion **Hardest Hit Fund**. The program was unique in several ways:

- Financial hardship required, but not delinquency
- Targeted toward unemployed homeowners
- Stabilize mortgage payment during job search
- Administered at the state level by state HFAs
- No rigorous evaluations; only SIGTARP reports



HHF Assistance Types

Types of HHF Mortgage Assistance, by Year (CA, FL, NJ, DC, NC, OH, OR, TN)					
	Reinstatement	Mortgage Payment Assistance	Modification	Other	N
2011	18.1%	80.6%	0.9%	0.4%	22,774
2012	27.1%	70.4%	1.7%	0.8%	47,113
2013	29.8%	62.0%	5.2%	3.0%	52,839
2014	28.5%	50.8%	14.9%	5.9%	49,210
Total	27.1%	63.6%	6.5%	2.9%	171,936

Notes: These estimates are calculated by compiling results from HHF quarterly reports through Q4 2017 produced by housing finance agencies (HFA) that are included in our study. Links to HFA HHF websites are available at <https://www.treasury.gov/initiatives/financial-stability/TARP-Programs/housing/Pages/Program-Documents.aspx>.

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HHF and Mortgage Outcomes

Intervention that temporarily reduces (eliminates) mortgage payment during an income shock:

- Monthly cash flow is more predictive of mortgage default than home equity/LTV (Gerardi et al., 2018)
- Duration of unemployment insurance (UI) benefits is associated with a decrease in the likelihood of mortgage default (Tian et al., 2016)
- Each additional \$1,000 of extended UI benefits decreases the likelihood of mortgage delinquency by 24 basis points among households experiencing a layoff (Hsu, Matsa, and Melzer, 2018)
- But what about after the payment assistance ends? Does temporary payment assistance (without modification) simply delay inevitable default?

Research question:

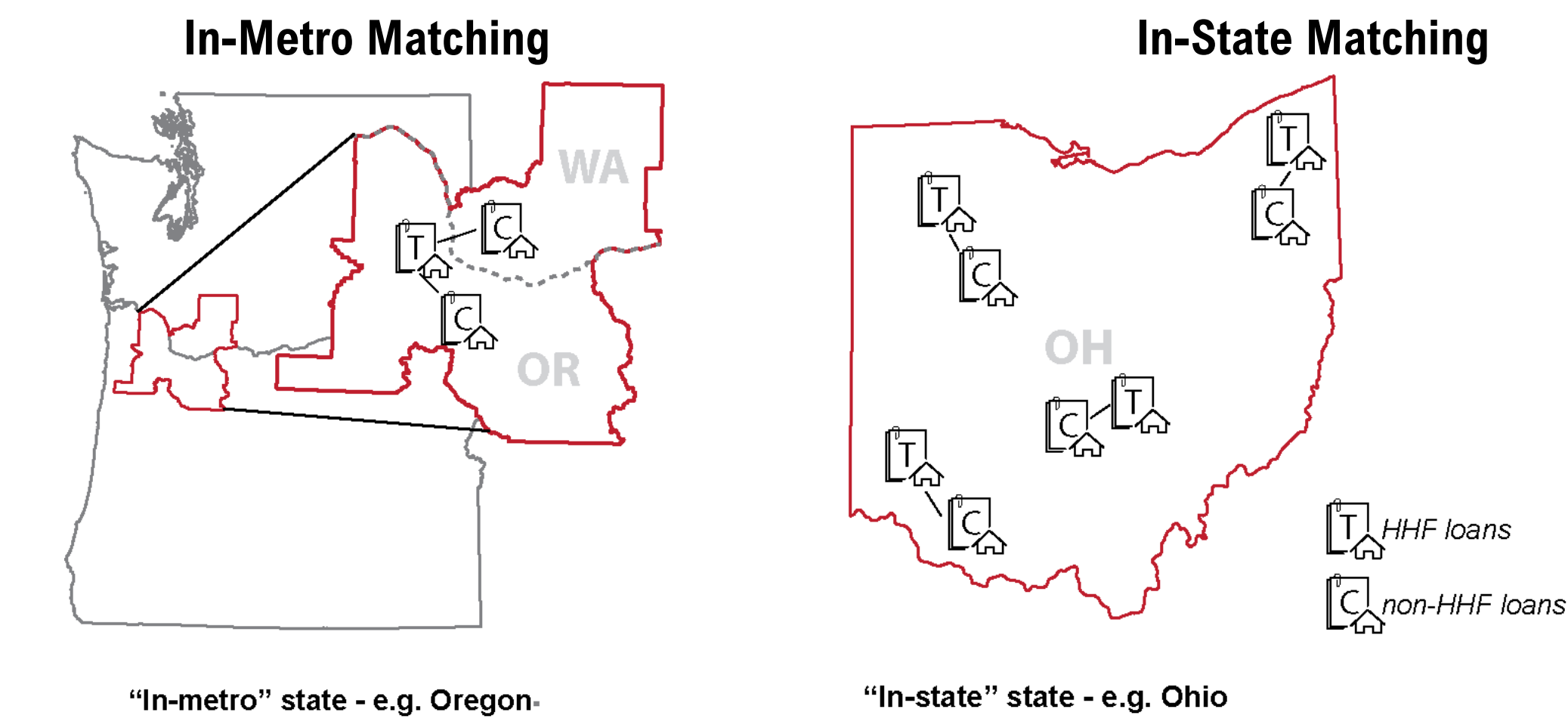
- Does the receipt of mortgage assistance through HHF reduce the likelihood of re-default and foreclosure over the long term?

Research Design

We aim to estimate the causal effect of HHF on loan outcomes, relative to otherwise similar homeowners. Otherwise similar homeowners would ideally experience a similar shock to HHF borrowers, but not receive HHF.

	Delinquent				HHF Lien Recorded													
	-17 ... -6	-5	-4	-3	-2	-1	0	+1	...	+12	...	+24	...	+36	...	+48		
HHF Recipients	Matching Period		HHF Application Period				Analysis Period											
Comparison Group	Matching Period																Analysis Period	

We cannot observe employment shocks for non-HHF borrowers, so we **proxy** employment shock with 60-day mortgage delinquency and **limit** the HHF sample to those who experienced a 60-day delinquency within 6-18 months prior to HHF and **match** HHF and non-HHF borrowers.



- Identify HHF loans in MSAs in 5 HHF states: OH, FL, CA, TN, NC.
- Match HHF borrowers in the HHF state to a borrower in the same MSA and in the HHF state; control for MSA
- Identify MSAs that cross HFA and non-HFA states.
- Match HHF borrowers in the HHF state to a borrower in the same MSA but in the non-HHF state; include MSA fixed effects
- Match HHF borrowers in the HHF state to a borrower in the same MSA and in the HHF state; control for HHF state to help absorb "state" effects

Competing Risk MNL

$$\ln\left(\frac{Pr(Y_i = D)}{Pr(Y_i = A)}\right) = \alpha_D + \beta_D HHF_i + \gamma_D' X_i$$

$$\ln\left(\frac{Pr(Y_{it} = P)}{Pr(Y_{it} = A)}\right) = \alpha_P + \beta_P HHF_i + \gamma_P' X_i$$

D= Default (90+, Foreclosure or REO), P= Prepayment, A= Active
X= **original loan balance**, original loan term, **VA/FHA, FRM, subprime**, piggyback, **credit score at origination**, **loan age**, **baseline loan-to-value ratio**, **number of months delinquent at baseline**, **foreclosure at baseline**, loan modification during baseline period, baseline year, HFA state dummy, and **MSA** fixed effects
(Note: Red font indicates variables included in matching)

CoreLogic Data

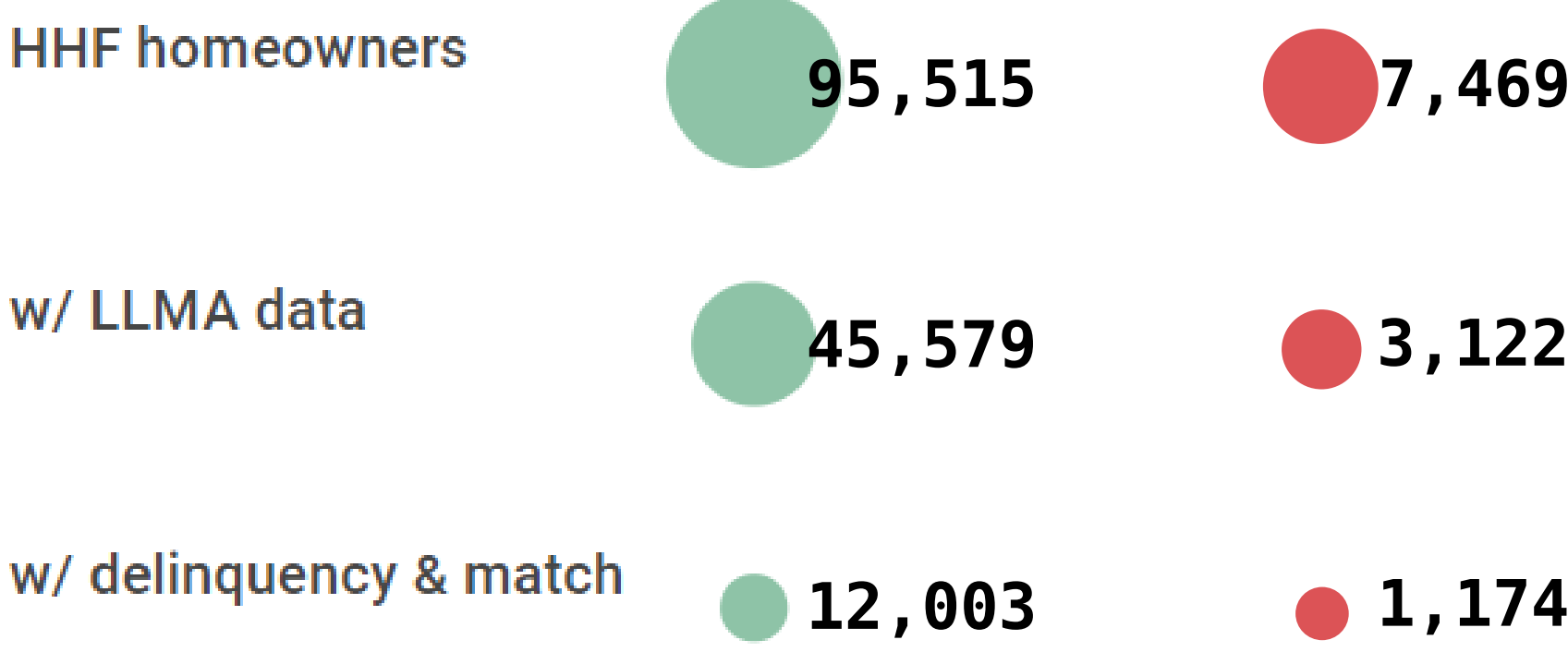
Public Property Records

- Tax** – property-level appraisal and other property characteristics
- Transactions** –all publicly recorded transactions that have ever been associated with a given property-homeowner combination

Loan Level Market Analytics

- LLMA** - loan-level data for each mortgage at the time of origination
- LLMA History** – provides performance data on the loans in the LLMA dataset

Analysis Samples, HHF Recipients



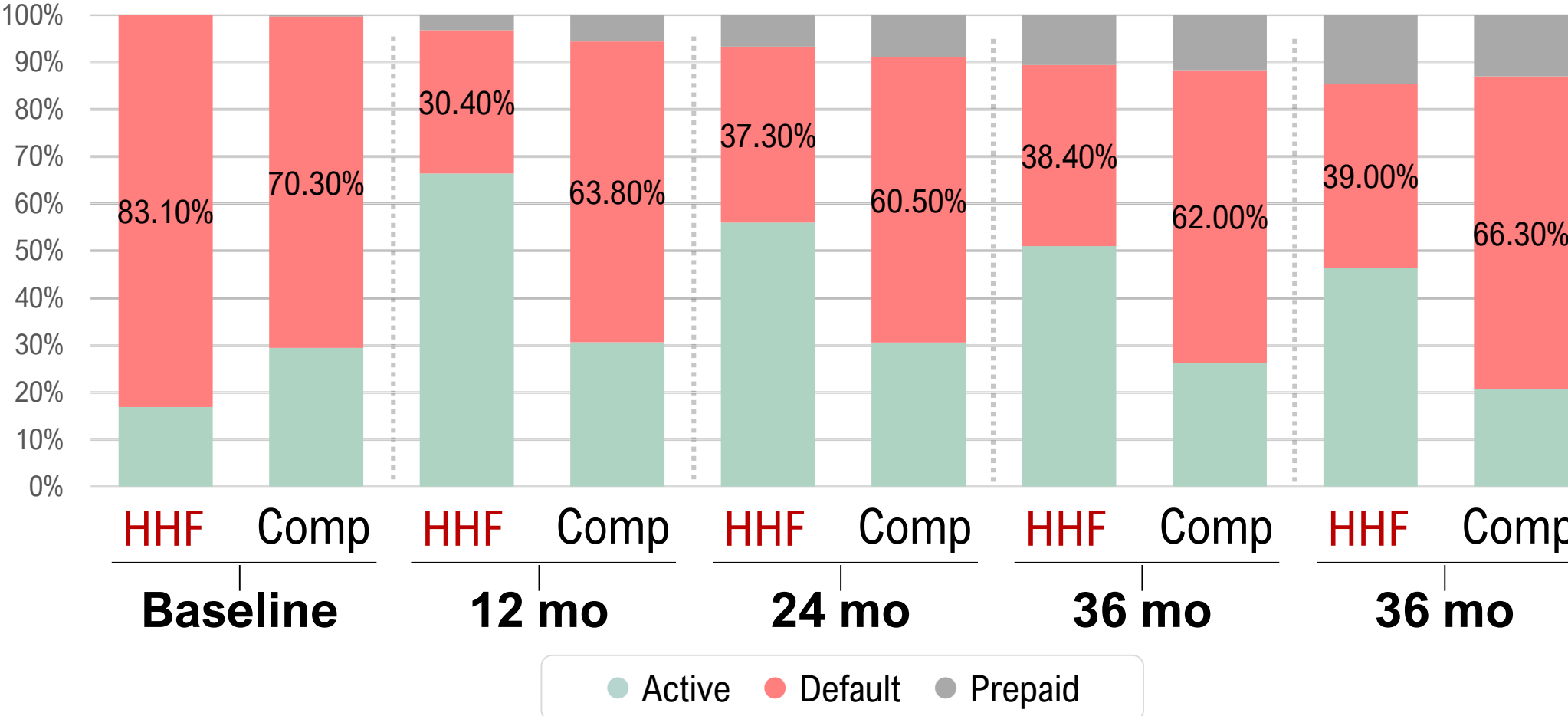
Baseline Characteristics, In-Metro Sample

	HHF Recipient		Comparison		t-statistic
	mean	sd	mean	sd	p
# Prior 60+ delinquency at baseline period	4.239	2.098	4.239	2.097	(1.00)
Prior foreclosure at the baseline period	0.281	0.450	0.281	0.450	(1.00)
Original loan balance (logged)	12.196	0.427	12.221	0.412	(0.09)
Total OLVY (top coded at 115%)	0.847	0.159	0.848	0.152	(0.85)
VA or FHA	0.406	0.491	0.406	0.491	(1.00)
Fixed Rate	0.821	0.383	0.812	0.391	(0.50)
Subprime	0.136	0.343	0.109	0.312	(0.02)
FICO *					
≤ 580	0.121	0.326	0.113	0.317	(0.50)
581-620	0.122	0.327	0.126	0.332	(0.72)
621-660	0.281	0.450	0.282	0.450	(0.98)
661-720	0.240	0.427	0.241	0.428	(0.96)
> 720	0.114	0.318	0.116	0.321	(0.85)
Missing	0.122	0.327	0.122	0.327	(1.00)
Observations	1,174		2,348		3,522

Note: *Reference group is underlined.

Results

In Metro: Summary of Mortgage Status, HHF v. Comparison Groups



Note: Proportions are of the total observations in each period. All differences between HHF and comparison groups statistically significant at p<.01.

Exploring the Counterfactual: Loan Modification vs. Self-Cure

Pre-modification (HHF: 14%, Comparison: 16%):

- Any substantial change in monthly payment amount (≥ ±3%), active loan balance (≥ ±3%), or interest rate (≥ ±10 basis points); and
- Cures from 60+ days delinquent to current after the first delinquency (-17 to -2 months)

Self Cure (HHF: 12%, Comparison: 11%):

- Cures from 60+ days delinquent to current after the first delinquency (-17 to -2 months) without a modification.

MNL Predicting Def. (90+/FC/REO) & Prepaid Status, Avg Marg. Effects, In Metro

	-1mo		12mo		24mo		36mo		48mo	
	Default	Prepaid	Default	Prepaid	Default	Prepaid	Default	Prepaid	Default	Prepaid
HHF	0.138*** (0.017)	-0.040** (0.013)	-0.319*** (0.015)	-0.022* (0.009)	-0.244*** (0.018)	-0.017 (0.011)	-0.242*** (0.019)	0.000 (0.014)	-0.253*** (0.026)	0.023 (0.020)
PreMod	-0.382*** (0.010)	0.002 (0.001)	-0.252*** (0.022)	0.052*** (0.009)	-0.209*** (0.023)	0.064*** (0.011)	-0.207*** (0.026)	0.085*** (0.014)	-0.186*** (0.037)	0.104*** (0.021)
SelfCure	-0.328*** (0.012)	0.001 (0.002)	-0.229*** (0.025)	0.050*** (0.010)	-0.215*** (0.027)	0.066*** (0.013)	-0.181*** (0.030)	0.058*** (0.017)	-0.206*** (0.039)	0.093*** (0.023)

Liquidity or underwater? HHF w/ & w/out balance reduction (10%, HHF borrowers)

MNL Predicting Def. (90+/FC/REO) & Prepaid Status, Avg Marg. Effects, In Metro

	-1mo		12mo		24mo		36mo		48mo	
	Default	Prepaid	Default	Prepaid	Default	Prepaid	Default	Prepaid	Default	Prepaid
No	0.105*** (0.017)	-0.006** (0.002)	-0.322*** (0.019)	-0.032*** (0.007)	-0.235*** (0.020)	-0.031** (0.010)	-0.237*** (0.022)	-0.023 (0.014)	-0.268*** (0.030)	0.007 (0.022)
With reduction	0.277*** (0.016)	-0.006** (0.002)	-0.530*** (0.027)	0.025 (0.029)	-0.420*** (0.033)	0.063 (0.039)	-0.404*** (0.039)	0.142** (0.049)	-0.396*** (0.068)	0.177* (0.076)

Note: Control variables included in model, not shown in table: In HHF State, Ln(Loan Age), Prior 60+ Delinquency, Prior Foreclosure, Ln(Original Balance), Total OLVY (decimal), VA or FHA, Fixed Rate, Subprime, Piggyback, FICO, and Loan Term. Standard errors in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
1 Reference groups: 621-660 (FICO); 241-480 months (Loan term); New York-Newark-Jersey City, NY-NJ-PA (MSA); Year of 2011 (HHF year)

Bottom Line

HHF is associated with reduction in re-default risk by more than 60% at 24 months post- baseline and 50% at 36 months post-baseline.

- Haughwout et. al (2016) found interest rate modifications reduce re-default by 10% at 12 months, while loan balance and rate modifications reduce re-default by 40% at 12 months.

Improving homeowner cash flow by temporarily eliminating the mortgage payment can improve long-term mortgage performance.

- For underwater homeowners, it can be more cost efficient to temporarily pay mortgage payment while economic shock than paying down principal balance.

Limitations:

- Selection into HHF; bias would likely reduce ability to detect effects
- Observing the mechanism
- Data limits period of observation to 48 months following assistance date