

**Internet Appendix for:**  
**"The Effect of Mortgage Securitization on Foreclosure and Modification"**

## **1. Modification algorithm**

The LPS data set lacks an explicit modification flag but contains enough detailed panel information to identify changes to loan terms over time. My loan modification algorithm differs in some details but is essentially the same as the algorithm employed by Adelino, Gerardi, and Willen (2013). The purpose of the algorithm is to identify changes to loan terms that are consistent with modification and do not have other likely explanations. Some changes are enough to identify a modification on their own. For example, absent errors in the data, an interest rate change to a fixed rate loan must stem from modification. Other changes require confirmatory evidence. For example, a principal reduction could be from a modification or from a prepayment. The size of the reduction, changes in monthly payments, and other simultaneous modifications all inform whether the reduction stems from a modification. In all cases, the loans in question are seriously delinquent at the time of the potential modification, adding to the likelihood that the algorithm is identifying true modifications. The algorithm separately identifies four types of modifications: interest rate reductions, term extensions, principal decreases, and principal increases. These modifications are not mutually exclusive and often take place simultaneously. I consider a loan to be modified if the algorithm flags it with any of the four modification types.

### **1.1. *Interest rate reductions***

Interest rate reductions are easiest to identify in fixed-rate loans and adjustable-rate loans that are still in their introductory fixed-rate period. For these loans, I define an interest rate reduction as a change that reduces a loan's interest rate to at most 0.5 ppt below the previous month's rate and the loan's origination interest rate.

For adjustable-rate mortgages, I first compute a fully indexed interest rate for each loan in each month using LPS data on the loan's reference index and spread combined with time-series data on the index rates. For example, a loan that references LIBOR and has a spread of 2 ppt would have a fully indexed rate of LIBOR + 2 ppt in any month. I abstract from details on exactly

how frequently rates reset and consider any loan to be adjustable if it is past or within 2 months of the end of its introductory period. To be flagged as an interest rate reduction, a loan's interest rate must decrease to at most 0.5 ppt below the previous month's rate and 1 ppt below the fully indexed rate.

### **1.2. *Term extensions***

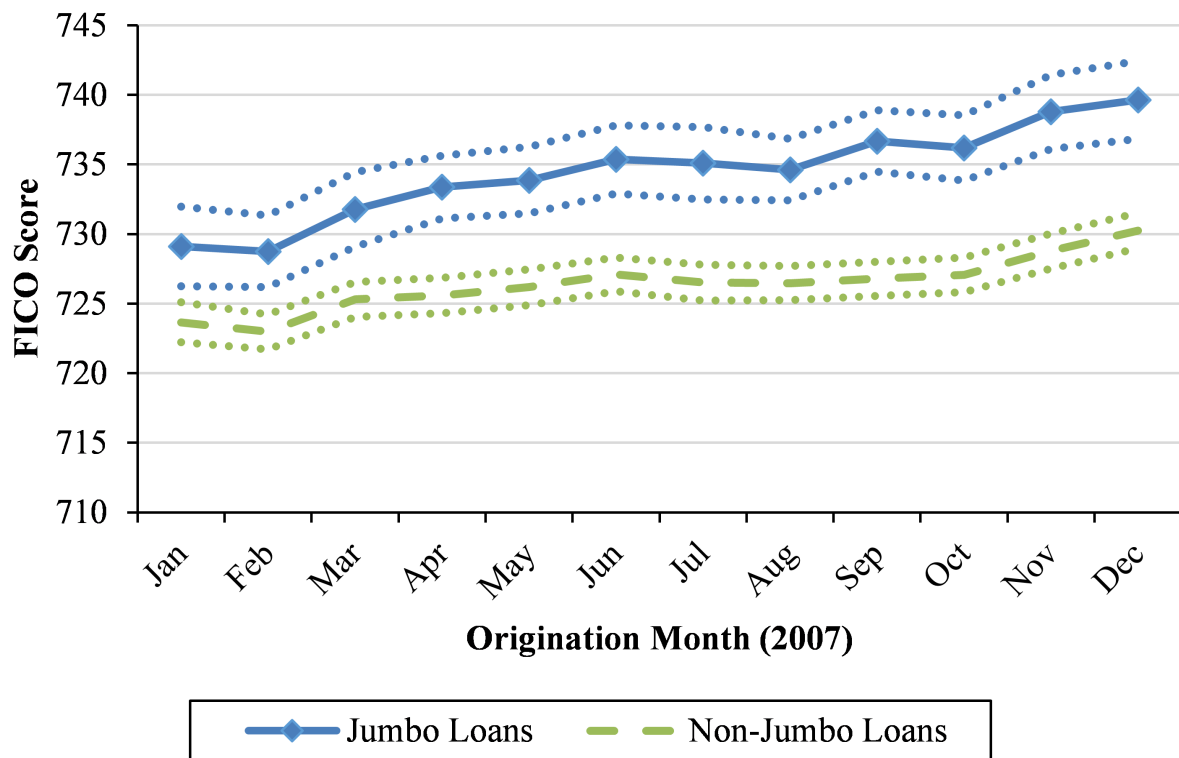
To be flagged as a term extension, a loan's remaining term to maturity must increase by at least 12 months. The term extension must be contemporaneous with a payment, interest rate, or principal change.

### **1.3. *Principal decreases***

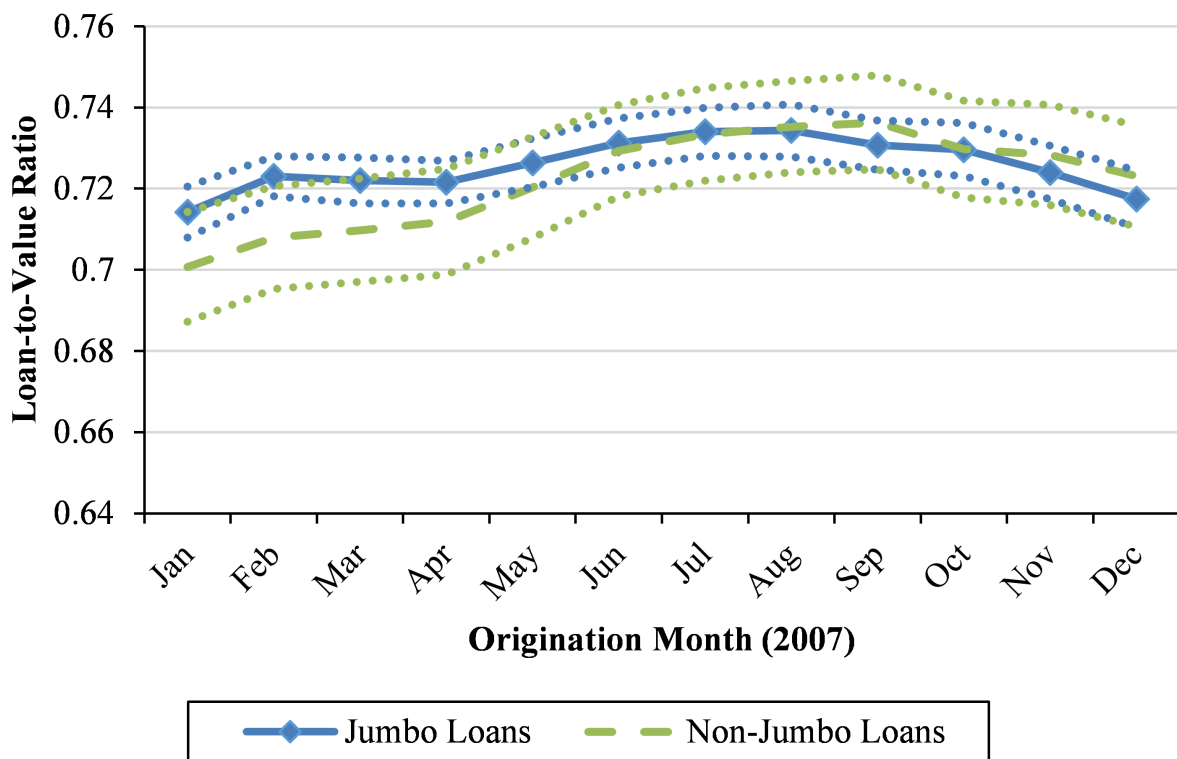
To be flagged as a principal decrease, the mortgage must have had outstanding principal of at least \$25K in the previous month, and the principal balance must have decreased by between 10% and 30% and be accompanied by a payment, interest rate, or term change. The 10-30% range is used to differentiate modifications from scheduled principal decreases and prepayments. Adelino, Gerardi, and Willen (2013) experiment with the 30% cutoff and find that results are not sensitive to its exact value.

### **1.4. *Principal increases***

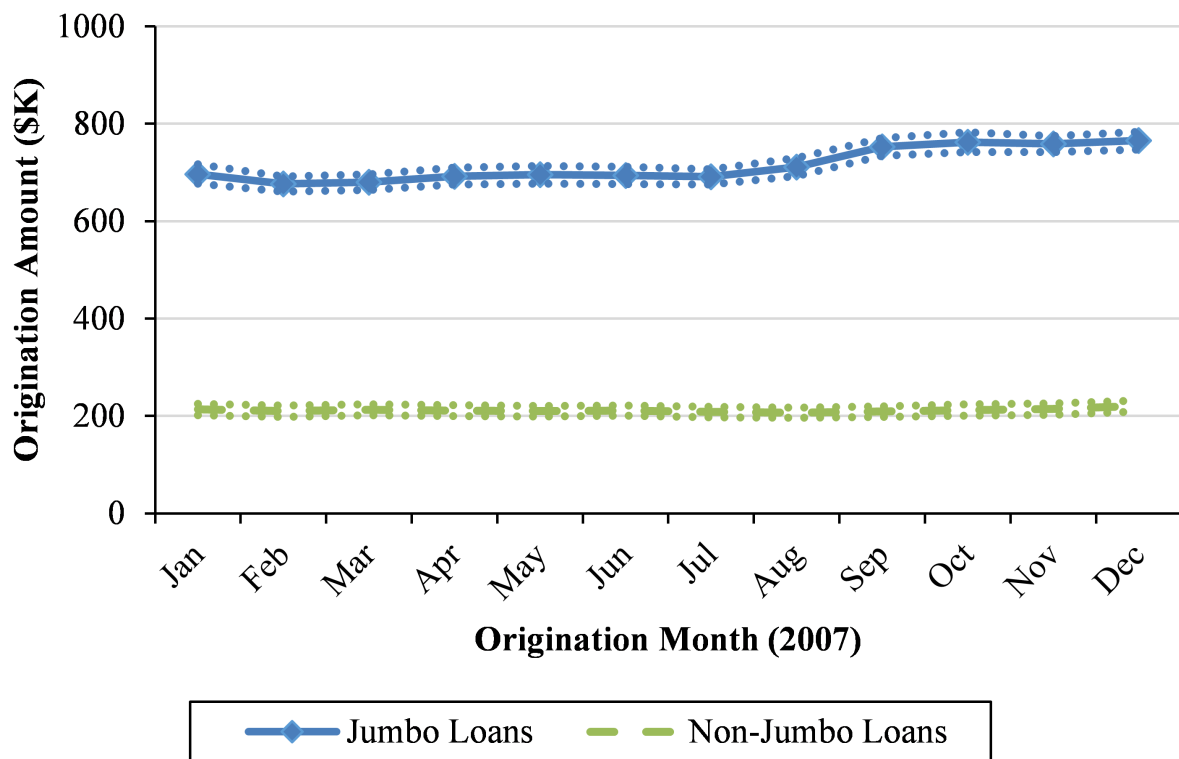
To be flagged as a principal increase, principal must increase by at least 1% and be accompanied by a payment, interest rate, or term change. Because of their potential for negative amortization, option ARM principal increases are not flagged as modifications.



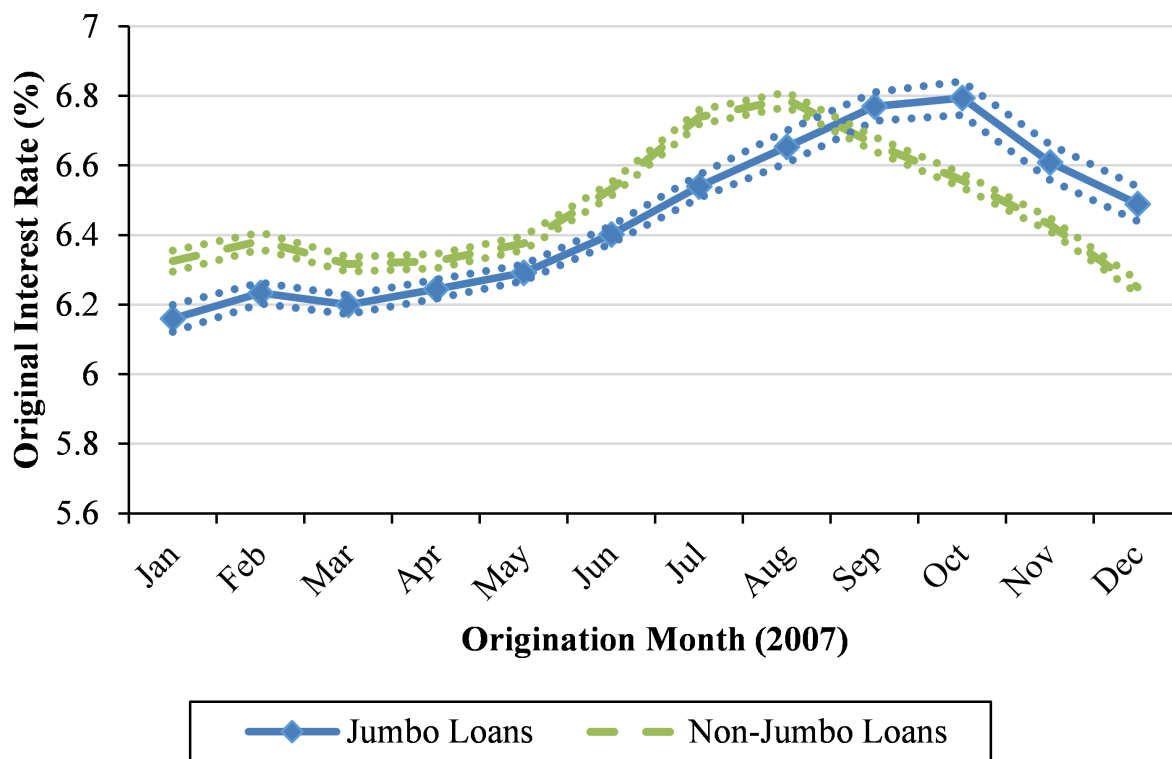
**Fig. A1.** FICO score by origination month. Mean FICO scores for sample jumbo and non-jumbo loans. Dotted lines represent 95% confidence intervals.



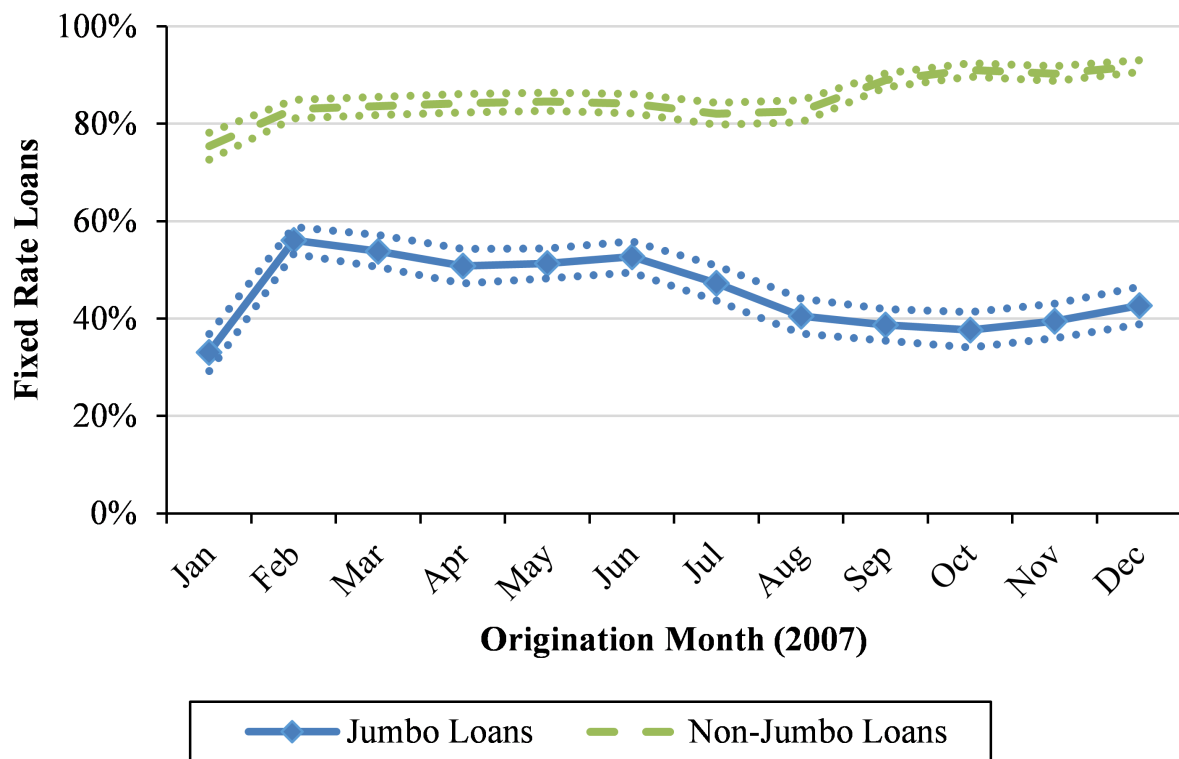
**Fig. A2.** Loan to value ratio by origination month. Mean loan to value ratios for sample jumbo and non-jumbo loans. Dotted lines represent 95% confidence intervals.



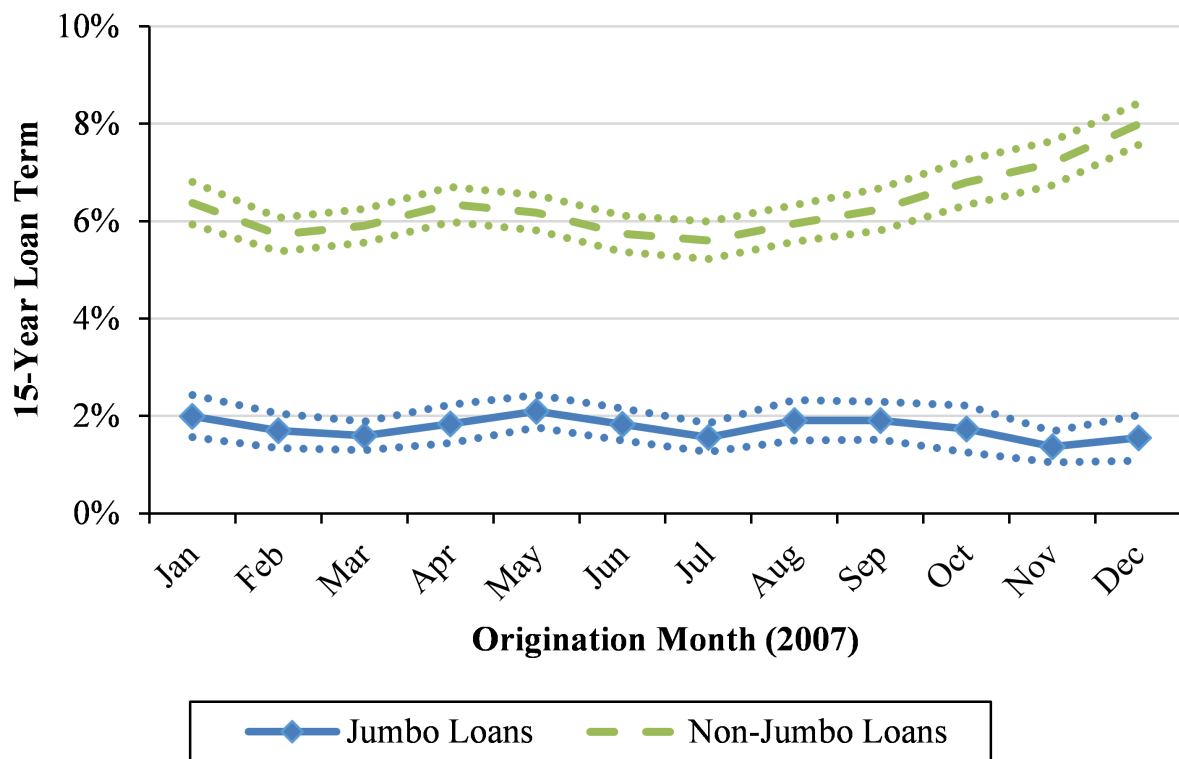
**Fig. A3.** Origination amount by origination month. Mean loan origination amounts for sample jumbo and non-jumbo loans. Dotted lines represent 95% confidence intervals.



**Fig. A4.** Original interest rate by origination month. Mean original interest rates for sample jumbo and non-jumbo loans. Dotted lines represent 95% confidence intervals.

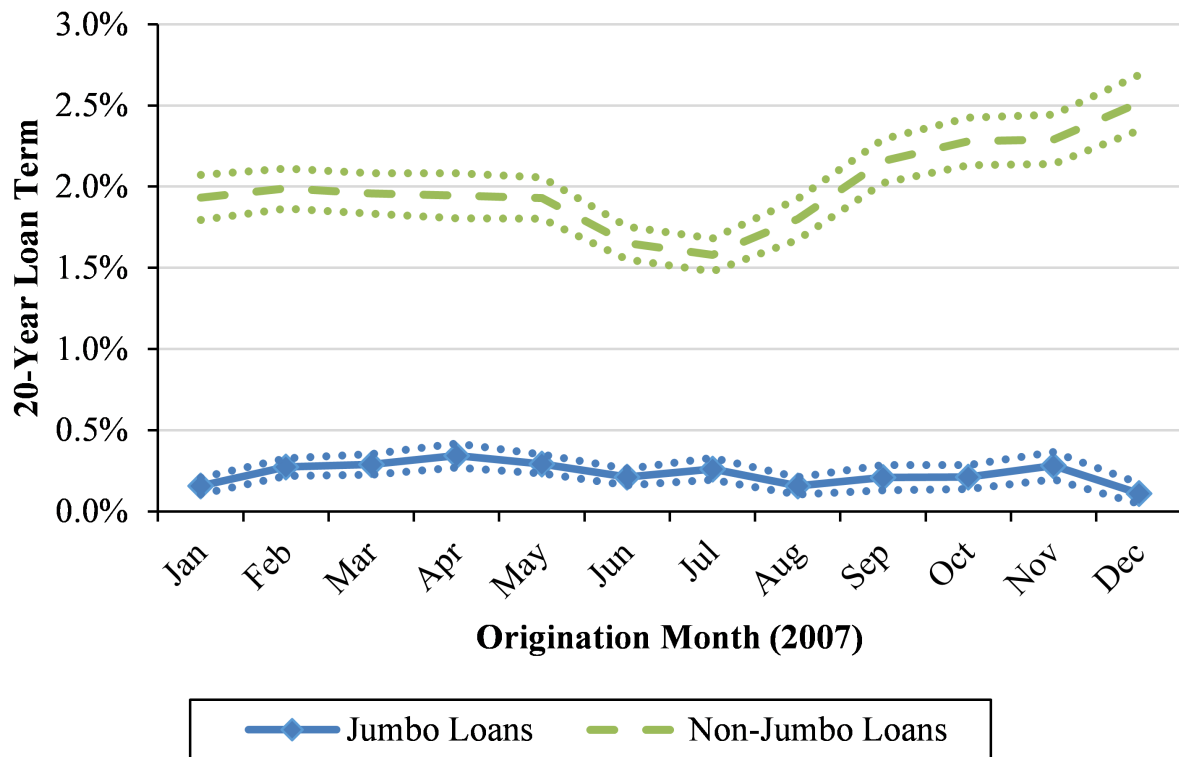


**Fig. A5.** Fixed rate loans by origination month. Percent of sample jumbo and non-jumbo loans with fixed interest rates. Dotted lines represent 95% confidence intervals.

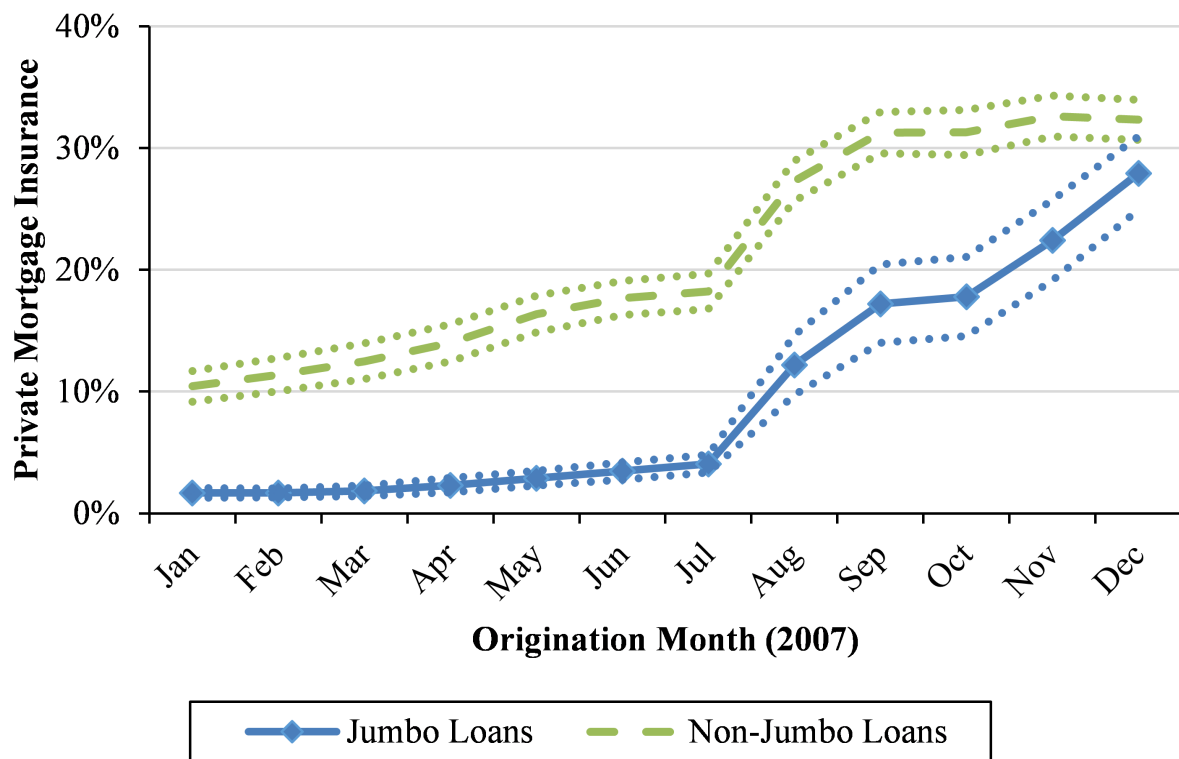


**Fig. A6.** Fifteen-year term loans by origination month. Percent of sample jumbo and non-jumbo loans with terms of 15 years. Dotted lines represent 95% confidence intervals.

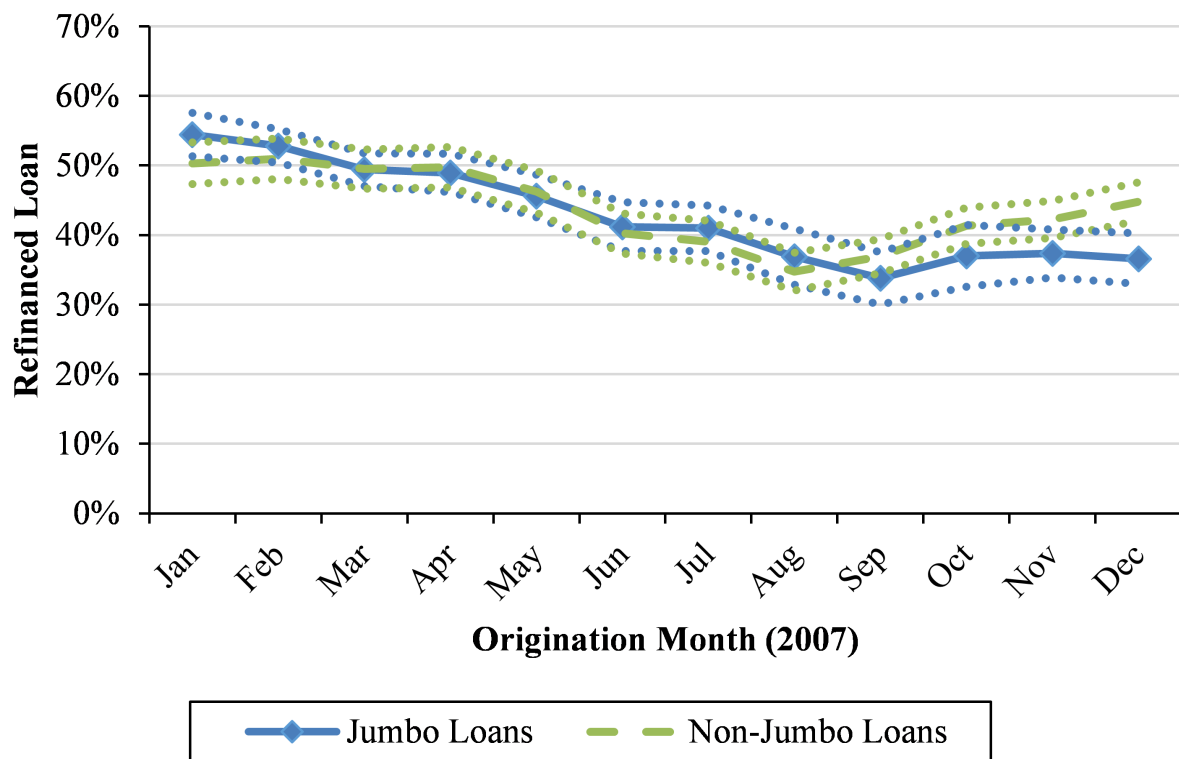




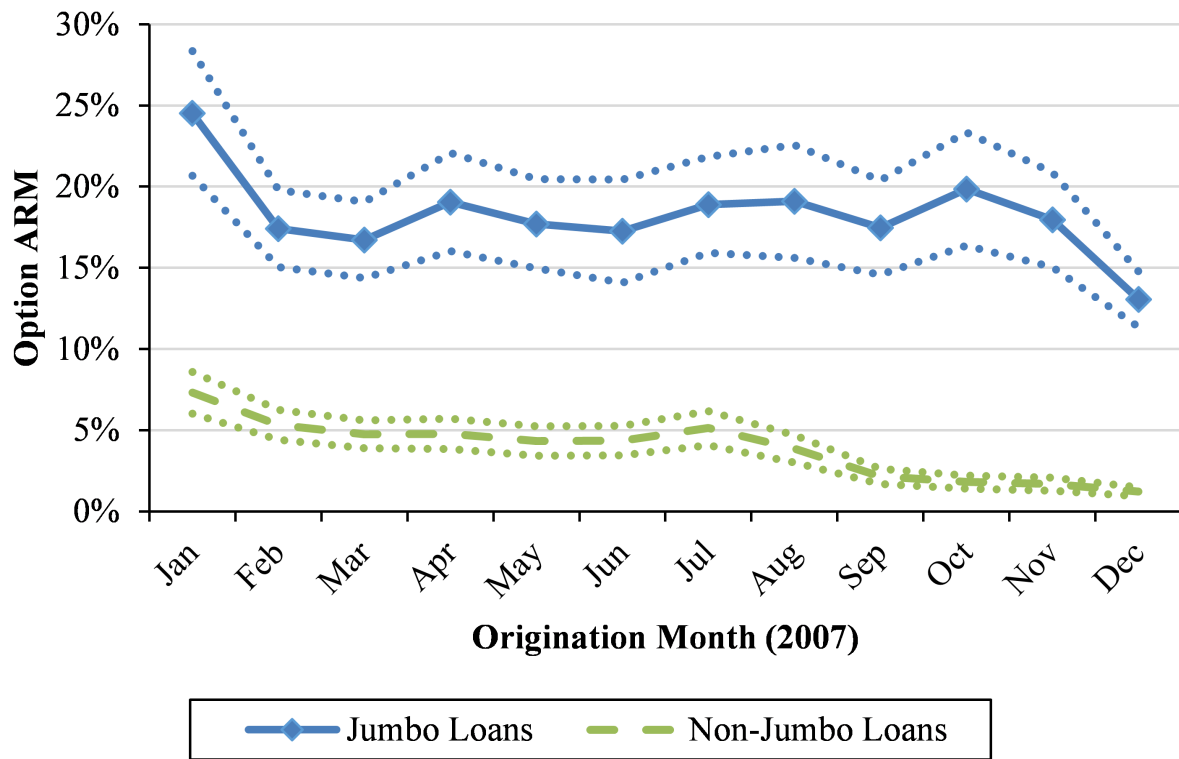
**Fig. A7.** Twenty-year term loans by origination month. Percent of sample jumbo and non-jumbo loans with terms of 20 years. Dotted lines represent 95% confidence intervals.



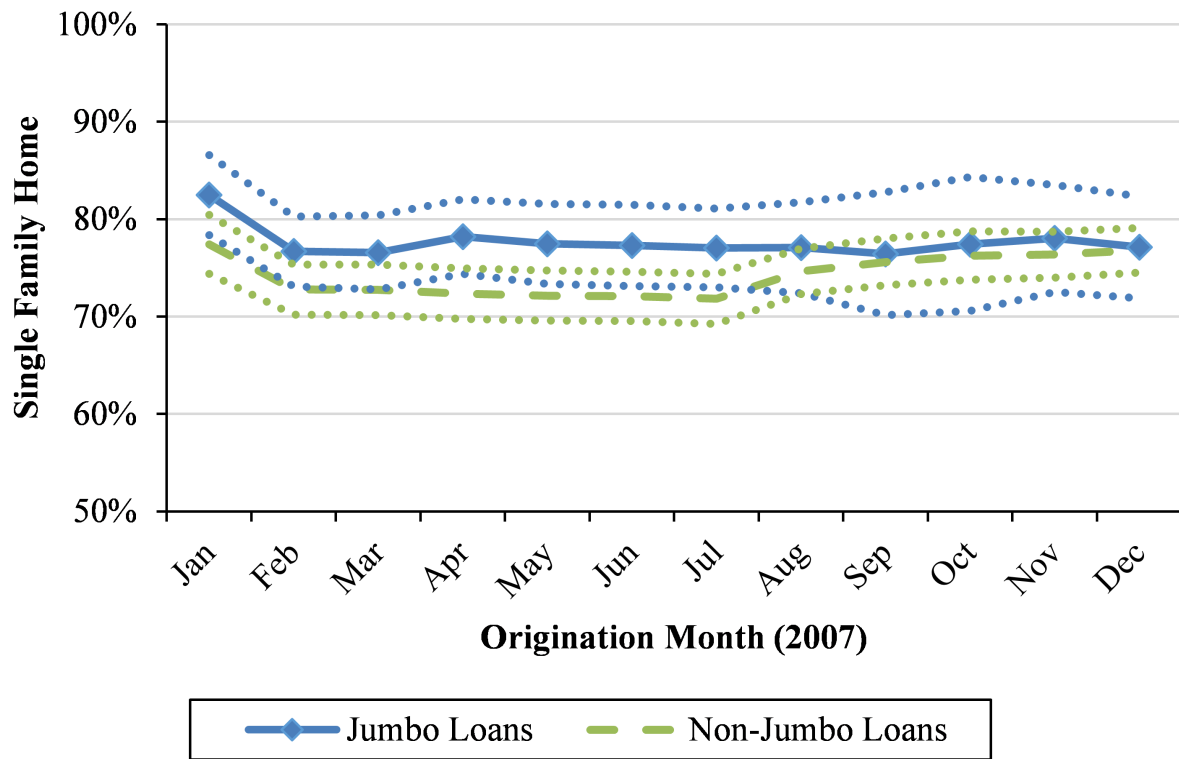
**Fig. A8.** Private mortgage insurance by origination month. Percent of sample jumbo and non-jumbo loans with private mortgage insurance. Dotted lines represent 95% confidence intervals.



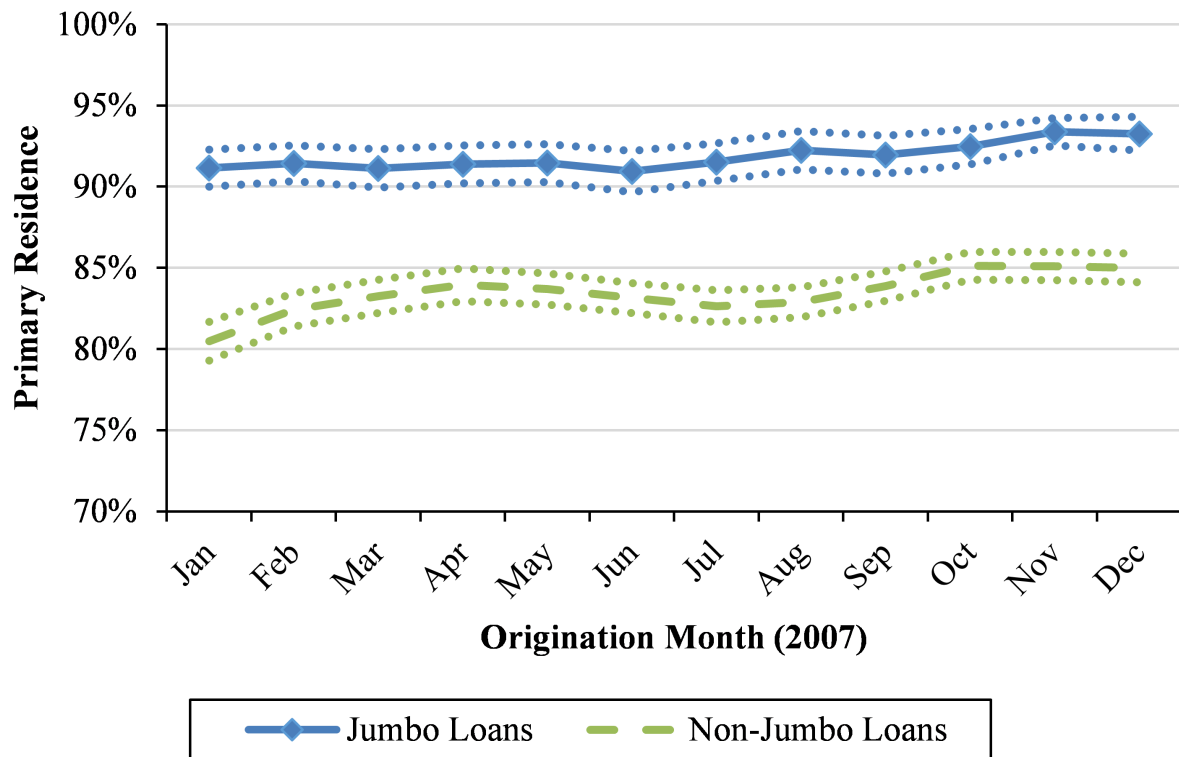
**Fig. A9.** Refinance loans by origination month. Percent of sample jumbo and non-jumbo loans that were originated to refinance previous mortgages. Dotted lines represent 95% confidence intervals.



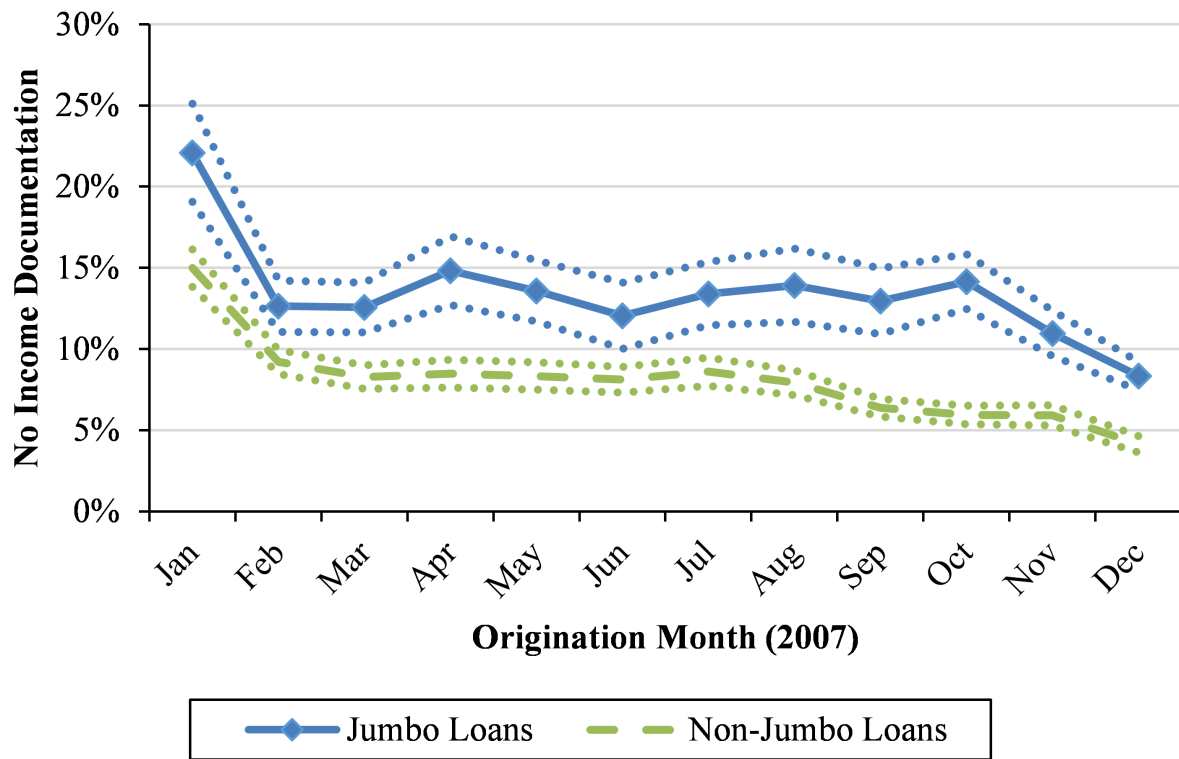
**Fig. A10.** Option ARM loans by origination month. Percent of sample jumbo and non-jumbo loans that are option ARM loans. Dotted lines represent 95% confidence intervals.



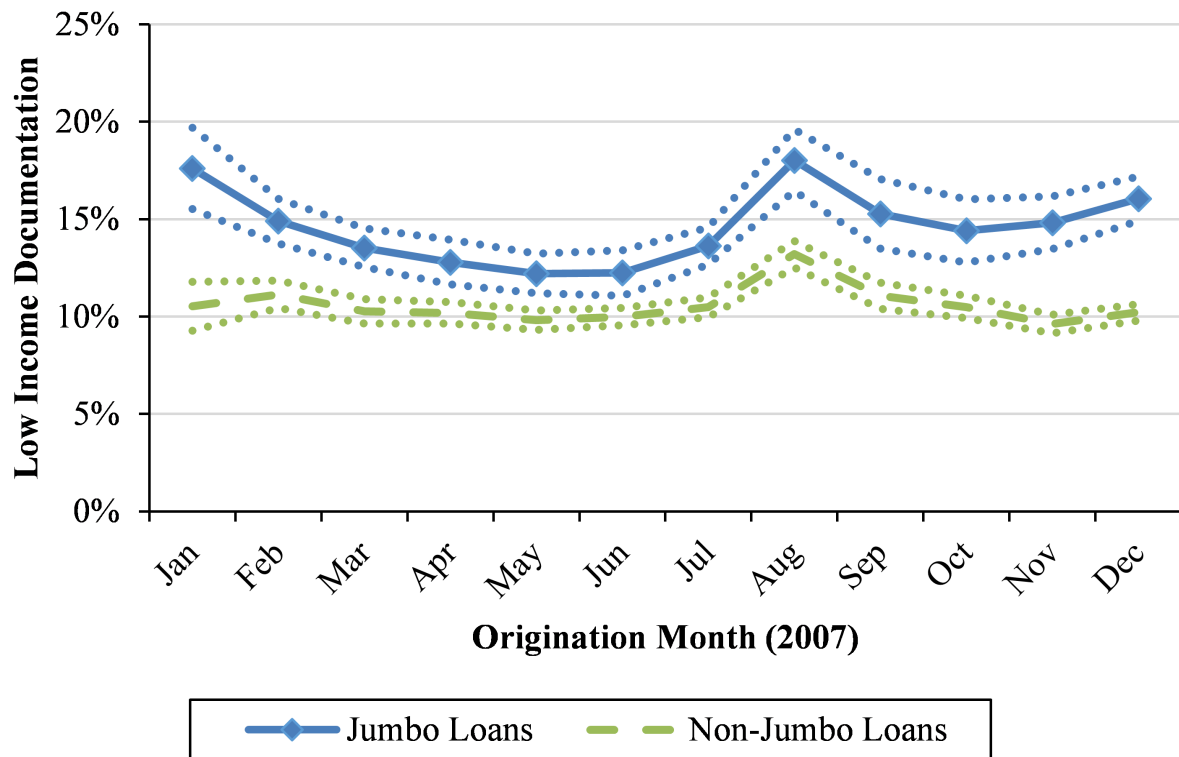
**Fig. A11.** Single family loans by origination month. Percent of sample jumbo and non-jumbo loans that are secured by single family homes. Dotted lines represent 95% confidence intervals.



**Fig. A12.** Primary residence loans by origination month. Percent of sample jumbo and non-jumbo loans that are secured by primary residences. Dotted lines represent 95% confidence intervals.



**Fig. A13.** No income documentation loans by origination month. Percent of sample jumbo and non-jumbo loans with no income documentation. Dotted lines represent 95% confidence intervals.



**Fig. A14.** Low income documentation loans by origination month. Percent of sample jumbo and non-jumbo loans with low income documentation. Dotted lines represent 95% confidence intervals.



**Table A1.**

Securitization by age for January jumbo loans.

Sample includes all jumbo sample loans that were originated in January of 2007. Age is months since origination. Loans are added to the LPS data over time and can change ownership. Number of loans and percent of loans privately securitized is reported by age.

Age (months)	Loans	% Privately Securitized
0	12,715	12%
1	18,208	43%
2	19,069	66%
3	20,338	75%
4	21,023	78%
5	21,558	79%
6	21,811	79%

**Table A2.**

Additional robustness checks.

Regressions are the same as the baseline IV regression in the main paper (Table 3, columns 2-5) except where noted. Columns 1-4 of Panel A analyze six-month foreclosure and modification probabilities on a sample that is restricted to loans that became seriously (60+ days) delinquent within twelve months of origination. Columns 5-8 of Panel A adds a linear origination month time trend and uses indicator variables for June, July, and August originations as instruments for private securitization. Columns 1-4 of Panel B analyze a sample that is restricted to high quality loans with full income documentation and FICO scores of at least 680. Columns 5-8 of Panel B analyze a sample that is restricted to refinance loans. Columns 1-4 of Panel C analyze a sample that is restricted to zip codes with combined (second lien and occupancy) misreporting rates of less than 7.5% based on data from Piskorski, Seru, and Witkin (2015). Columns 5-8 of Panel C analyze a sample that is restricted to zip codes with worse originator market shares of less than 5% based on data from Griffin and Maturana (2016b). Columns 1-4 of Panel D drop loans in MSAs that represent more than 1% of 2007 origination volume. Columns 5-8 of Panel D drop loans in CA, FL, NV, and AZ. Columns 1-4 of Panel E drop loan characteristic controls. Columns 5-8 of Panel E add back loans transferred to non-LPS servicers, which were previously dropped from the sample. Columns 1-4 of Panel F control for origination-month fixed effects using non-jumbo loans without controlling for the interaction between private securitization and non-jumbo status. Columns 5-8 of Panel F control for origination-month fixed effects using non-jumbo loans on a restricted sample of loans with origination values between \$300K and \$550K. R-squared statistics are calculated within MSAs. Clustered (by MSA) standard errors are in parentheses. \* represents 10% significance, \*\* represents 5% significance, \*\*\* represents 1% significance.

*A. Pre-HAMP six-month regressions (1-4) and origination-month linear time trend (5-8)*

	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.695	0.134	0.019	0.045	0.594	0.175	0.140	0.151
<b>Priv. Sec.</b>	0.080*** (0.016)	0.046*** (0.012)	-0.010* (0.006)	-0.016 (0.017)	0.088*** (0.016)	0.037*** (0.013)	-0.110*** (0.021)	-0.047*** (0.017)
<b>Orig. Mo.</b>					-0.002 (0.001)	-0.004*** (0.001)	0.000 (0.002)	0.000 (0.002)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	15,903	15,903	7,872	5,788	99,891	99,891	51,984	70,291
<b>R-Squared</b>	0.082	0.029	0.040	0.005	0.122	0.115	0.048	0.027

**Table A2.** (continued)  
Additional robustness checks.

<i>B. Sample restricted to high quality loans (1-4) and refinance loans (5-8)</i>								
	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.570	0.175	0.138	0.154	0.561	0.141	0.160	0.155
<b>Priv. Sec.</b>	0.156*** (0.019)	0.095*** (0.012)	-0.174*** (0.021)	-0.041*** (0.012)	0.081*** (0.009)	0.053*** (0.007)	-0.112*** (0.010)	-0.048*** (0.007)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	48,417	48,417	24,339	41,366	55,682	55,682	26,736	38,043
<b>R-Squared</b>	0.142	0.132	0.057	0.039	0.104	0.093	0.048	0.023
<i>C. Sample restricted to zip codes with low misreporting levels (1-4) and zip codes with low worse originator shares (5-8)</i>								
	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.552	0.158	0.149	0.163	0.602	0.137	0.114	0.129
<b>Priv. Sec.</b>	0.143*** (0.010)	0.083*** (0.010)	-0.106*** (0.010)	-0.056*** (0.009)	0.112*** (0.019)	0.051** (0.020)	-0.078*** (0.016)	-0.069*** (0.018)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	39,615	39,615	21,628	28,857	14,407	14,407	8,355	10,264
<b>R-Squared</b>	0.103	0.095	0.040	0.020	0.087	0.071	0.041	0.018

**Table A2.** (continued)  
Additional robustness checks.

*D. Sample restricted by dropping MSAs with high loan shares (1-4)  
and dropping CA, FL, NV, and AZ (5-8)*

	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.607	0.171	0.130	0.138	0.583	0.138	0.125	0.144
<b>Priv. Sec.</b>	0.125*** (0.015)	0.090*** (0.014)	-0.108*** (0.014)	-0.047*** (0.010)	0.130*** (0.020)	0.024 (0.017)	-0.067*** (0.017)	-0.062*** (0.014)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	29,562	29,562	16,269	21,545	27,675	27,675	15,273	18,365
<b>R-Squared</b>	0.103	0.089	0.040	0.022	0.085	0.076	0.043	0.017

*E. Regressions without loan characteristic controls (1-4) and with transferred loans (5-8)*

	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.594	0.175	0.140	0.151	0.582	0.162	0.137	0.145
<b>Priv. Sec.</b>	0.074*** (0.008)	0.047*** (0.008)	-0.102*** (0.008)	-0.044*** (0.005)	0.107*** (0.008)	0.078*** (0.008)	-0.102*** (0.008)	-0.041*** (0.004)
<b>Loan Char.</b>	No	No	No	No	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	99,891	99,891	51,984	70,291	109,215	109,215	57,008	77,249
<b>R-Squared</b>	0.083	0.076	0.032	0.014	0.121	0.109	0.041	0.021

**Table A2.** (continued)  
Additional robustness checks.

*F. Non-jumbo origination month control regressions without securitization  
x non-jumbo interaction (1-4) and restricted to \$300K to \$550K loans (5-8)*

	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.609	0.181	0.151	0.146	0.605	0.175	0.172	0.166
<b>Priv. Sec.</b>	0.111*** (0.013)	0.066*** (0.012)	-0.146*** (0.015)	-0.045*** (0.009)	0.081*** (0.013)	0.048*** (0.010)	-0.104*** (0.017)	-0.034*** (0.010)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes	Jan-Aug Yes
<b>Obs.</b>	552,474	552,474	263,959	392,890	171,239	171,239	78,910	119,195
<b>R-Squared</b>	0.074	0.072	0.051	0.036	0.100	0.100	0.066	0.037

**Table A3.**

OLS regressions with a 3-year analysis window.

The dependent variables are indicators for foreclosure initiation, foreclosure completion, imputed modification, and reported modification within three years of first serious (60+ days) delinquency. All regressions are OLS. Privately securitized is an indicator for private securitization as of six months after origination. All observable loan characteristics shown in Table 2 are included as unreported controls. The regressions analyze loans that became seriously (60+ days) delinquent before July of 2011. Panel A analyzes an expanded sample of loans that adds non-jumbo loans and loans with FICO scores below 620. Panel B analyzes the same sample of jumbo loans that are analyzed in Table 5. Panel C is restricted to subprime loans, defined as loans with FICO scores below 620. The imputed modification regression is restricted to mortgages with term length data. The reported modification regression is restricted to mortgages whose servicers reported modifications as of the month the loan became seriously delinquent. R-squared statistics are calculated within MSAs. Clustered (by MSA) standard errors are in parentheses. \* represents 10% significance, \*\* represents 5% significance, \*\*\* represents 1% significance.

<i>A. Full sample</i>				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS
	Foreclose Start	Foreclose	Imputed Modify	Reported Modify
<b>Mean</b>	0.748	0.366	0.280	0.276
<b>Privately Securitized</b>	0.093*** (0.004)	0.115*** (0.006)	-0.058*** (0.004)	-0.056*** (0.004)
<b>Loan Characteristics</b>	Yes	Yes	Yes	Yes
<b>Delinquency Month FE</b>	Yes	Yes	Yes	Yes
<b>Origination Month FE</b>	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes
<b>Origination Months</b>	Jan-Aug	Jan-Aug	Jan-Aug	Jan-Aug
<b>Include Non-Jumbo Loans</b>	Yes	Yes	Yes	Yes
<b>Observations</b>	544,341	544,341	267,976	377,990
<b>Adjusted R-Squared</b>	0.086	0.121	0.086	0.058

**Table A3.** (continued)  
OLS regressions with a 3-year analysis window.

<i>B. Jumbo sample</i>				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS
	Foreclose Start	Foreclose	Imputed Modify	Reported Modify
Mean	0.741	0.326	0.250	0.276
Privately Securitized	0.094*** (0.006)	0.108*** (0.008)	-0.100*** (0.006)	-0.054*** (0.004)
Loan Characteristics	Yes	Yes	Yes	Yes
Delinquency Month FE	Yes	Yes	Yes	Yes
Origination Month FE	No	No	No	No
MSA FE	Yes	Yes	Yes	Yes
Origination Months	Jan-Aug	Jan-Aug	Jan-Aug	Jan-Aug
Include Non-Jumbo Loans	No	No	No	No
Observations	88,774	88,774	45,905	61,373
Adjusted R-Squared	0.100	0.162	0.083	0.049
<i>C. Subprime sample</i>				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS
	Foreclose Start	Foreclose	Imputed Modify	Reported Modify
Mean	0.677	0.264	0.375	0.402
Privately Securitized	0.135*** (0.008)	0.230*** (0.013)	-0.032*** (0.008)	-0.054*** (0.011)
Loan Characteristics	Yes	Yes	Yes	Yes
Delinquency Month FE	Yes	Yes	Yes	Yes
Origination Month FE	No	No	No	No
MSA FE	Yes	Yes	Yes	Yes
Origination Months	Jan-Aug	Jan-Aug	Jan-Aug	Jan-Aug
Include Non-Jumbo Loans	Yes	Yes	Yes	Yes
Observations	54,237	54,237	36,869	32,788
Adjusted R-Squared	0.086	0.134	0.072	0.036

**Table A4.**

HAMP regressions with alternative eligibility cutoffs.

Regressions are the same as in Table 7 except that alternative standards are used for HAMP qualification. In columns 1 to 4, Eligible is an indicator for a loan being for a borrower's primary residence as of the loan's origination. In columns 5 to 8, Eligible is the combination of being a primary residence as of origination and having a principal balance  $\leq$  \$729,750 as of becoming seriously delinquent. The dependent variables are indicators for foreclosure initiation, foreclosure completion, imputed modification, and reported modification within one year of first serious (60+ days) delinquency. All regressions are OLS. All observable loan characteristics shown in Table 2 are included as unreported controls. The regressions analyze baseline sample jumbo loans, which became seriously (60+ days) delinquent in 2008 (pre-HAMP sample) or 2010 (post-HAMP sample). Privately securitized is an indicator for private securitization as of six months after origination. Post is an indicator for loans that became seriously delinquent in 2010, after HAMP was implemented. The imputed modification regression is restricted to mortgages with term length data. The reported modification regression is restricted to mortgages whose servicers reported modifications as of the month the loan became seriously delinquent. R-squared statistics are calculated within MSAs. Clustered (by MSA) standard errors are in parentheses. \* represents 10% significance, \*\* represents 5% significance, \*\*\* represents 1% significance.

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS
	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify	Foreclose Start	Foreclose	Imp. Modify	Rep. Modify
<b>Mean</b>	0.627	0.186	0.127	0.127	0.627	0.186	0.127	0.127
<b>Priv. Sec.</b>	0.030* (0.016)	0.028 (0.018)	-0.039** (0.019)	-0.027* (0.015)	0.061*** (0.011)	0.011 (0.010)	-0.055*** (0.013)	-0.066*** (0.013)
<b>Priv. Sec. * Post</b>	0.041 (0.046)	0.053* (0.027)	0.047 (0.034)	0.035 (0.027)	0.022 (0.018)	0.061*** (0.014)	0.003 (0.017)	0.069*** (0.018)
<b>Priv. Sec. * Post * Elig.</b>	-0.070 (0.046)	-0.044* (0.027)	-0.044 (0.039)	0.044* (0.024)	-0.055** (0.026)	-0.068*** (0.017)	-0.001 (0.020)	0.003 (0.019)
<b>Eligible</b>	-0.089*** (0.017)	-0.072*** (0.019)	0.051*** (0.015)	0.060*** (0.012)	-0.024* (0.014)	-0.045*** (0.013)	0.009 (0.012)	-0.010 (0.013)
<b>Post * Elig.</b>	-0.051 (0.038)	0.022 (0.023)	0.110*** (0.036)	0.053** (0.023)	-0.095*** (0.028)	0.035** (0.014)	0.092*** (0.022)	0.083*** (0.015)
<b>Priv. Sec. * Eligible</b>	0.064*** (0.018)	0.026 (0.022)	-0.046** (0.019)	-0.054*** (0.014)	0.036*** (0.012)	0.056*** (0.012)	-0.036*** (0.013)	-0.013 (0.014)
<b>Loan Char.</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Delinq. Mo. FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Mo. FE</b>	No	No	No	No	No	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Orig. Months Non-Jumbo</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Obs.</b>	43,404	43,404	21,560	32,280	43,404	43,404	21,560	32,280
<b>R-Squared</b>	0.138	0.088	0.043	0.028	0.141	0.089	0.046	0.030



**Table A5.**

Pre-Lehman regressions.

Regressions are the same as the 2007 delinquency year regressions in Table 6 except modifications and foreclosures are limited to actions taken by September of 2008. The dependent variables are indicators for foreclosure initiation, foreclosure completion, and imputed modification within one year and by September of 2008. The regressions estimate linear probability models for these indicators using origination-month indicators as instruments for private securitization status six months after origination. All observable loan characteristics shown in Table 2 are included as unreported controls. R-squared statistics are calculated within MSAs. Clustered (by MSA) standard errors are in parentheses. \* represents 10% significance, \*\* represents 5% significance, \*\*\* represents 1% significance.

	(2) IV	(3) IV	(4) IV
	Foreclose Start	Foreclose	Imputed Modify
<b>Mean</b>	0.843	0.431	0.013
<b>Privately Securitized</b>	0.081*** (0.025)	0.067** (0.029)	-0.019** (0.009)
<b>Loan Characteristic Controls</b>	Yes	Yes	Yes
<b>Delinquency Month FE</b>	Yes	Yes	Yes
<b>Origination Month FE</b>	No	No	No
<b>MSA FE</b>	Yes	Yes	Yes
<b>Origination Months Include Non-Jumbo Loans</b>	Jan-Aug No	Jan-Aug No	Jan-Aug No
<b>Observations</b>	7,628	7,628	3,836
<b>Adjusted R-Squared</b>	0.045	0.059	-0.023