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MORTGAGE INSURANCE

DATA AT A GLANCE

CONTENTS

Mortgage Insurance: Borrower Characteristics and Loan Performance

During the past 60 years, the private mortgage insurance (PMI) industry has enabled homeownership for borrowers who lack sufficient funds for a 20 percent down payment on a conventional mortgage. This data publication quantifies who these borrowers are and how they compare with borrowers without PMI (e.g., Federal Housing Administration, or FHA, and US Department of Veterans Affairs, or VA, borrowers) along key dimensions, such as loan-to-value (LTV) ratios, credit scores, and first-time homebuyer status. In addition to loan origination characteristics, this publication quantifies the performance of PMI-insured loans as measured by historical delinquency rates and loss severities, as well as the role of PMI in reducing loss to ultimate investors such as the lender, or the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac. This publication is being released as a data supplement to a comprehensive report on the past, present, and future of the PMI industry.

The data in this publication are explained in greater detail and with proper context in the comprehensive report, available at urban.org. This publication relies on four major data sources to provide as complete a picture of the private mortgage insurance market as possible.

Agency Mortgage Market

This section compares loan origination characteristics for GSE PMI mortgages with GSE non-PMI, FHA, and VA mortgages using loan-level agency security data (eMBS) for Ginnie Mae, Fannie Mae, and Freddie Mac, available from 2013 onward. These data contain all agency origination data, but they do not contain information on credit performance for GSE loans.

Servicing Data

This section analyzes loan origination data as far back as 2000 and includes data on delinquency and loss severity for 180 million open and closed loans (CoreLogic's Servicing Database). These data include both agency loans and bank portfolio loans. These servicer-contributed data are less complete, especially after 2012, as the mortgage servicing industry has become increasingly fragmented.

Private-Label Securities Data

This section shows origination and performance data for the private-label securities (PLS) market based on CoreLogic's Non-Agency Mortgage-Backed Securities Database. These data track PLS loans through liquidation and recovery, allowing for severity analysis.

Government-Sponsored Enterprise Loan-Level Credit Data

These data, covering loans from 1999 on, are provided by the GSEs in support of Fannie Mae's Connecticut Avenue Securities and Freddie Mac's Structured Agency Credit Risk deals and cover loans similar to those included in the deals: 30-year fixed-rate, full documentation, fully amortizing loans not purchased under special programs.

A FEW HIGHLIGHTS *OF THE REPORT*

- ***Private mortgage insurance borrowers*** tend to have higher credit scores and lower LTV and debt-to-income (DTI) ratios than FHA borrowers.
- ***Private mortgage insurance borrowers*** tend to have lower credit scores and higher LTV and DTI ratios and are more likely to be first-time homebuyers than conventional borrowers without PMI.
- ***Borrowers with PMI*** tend to have a lower probability of default than FHA borrowers, about the same probability of default as VA borrowers, and a higher probability of default than GSE borrowers without PMI.
- ***Government-sponsored enterprise loans*** with PMI have lower loss severities compared with non-PMI GSE loans, despite their higher LTV ratios because of PMI recovery proceeds.

Overview

Mortgage Insurance Market

The PMI share has varied widely since 1972. Historically, the PMI share has expanded during strong economic environments, with the FHA and VA share ramping up during downturns. After contracting during the most recent housing crisis, the PMI share has rebounded, but it is still below precrisis levels.

Mortgage Insurance Market Share based on Loan Count, 1972–2015

Sources: US Department of Housing and Urban Development (US Housing Market Conditions archives) and Mortgage Insurance Companies of America.

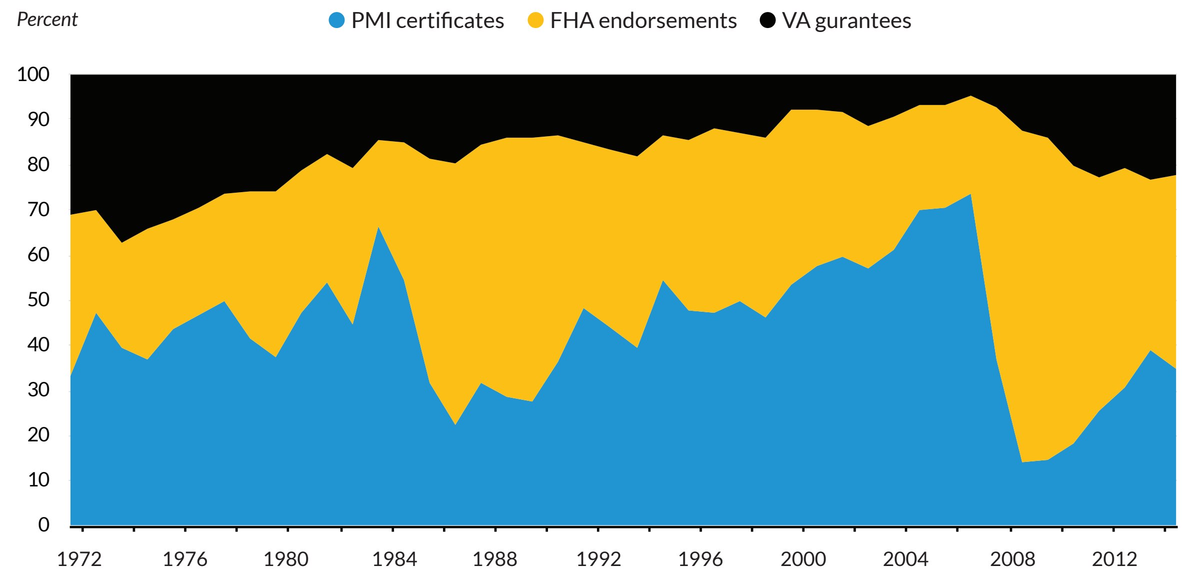
Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veteran Affairs.

Annual Mortgage Insurance Volume: PMI versus FHA/VA

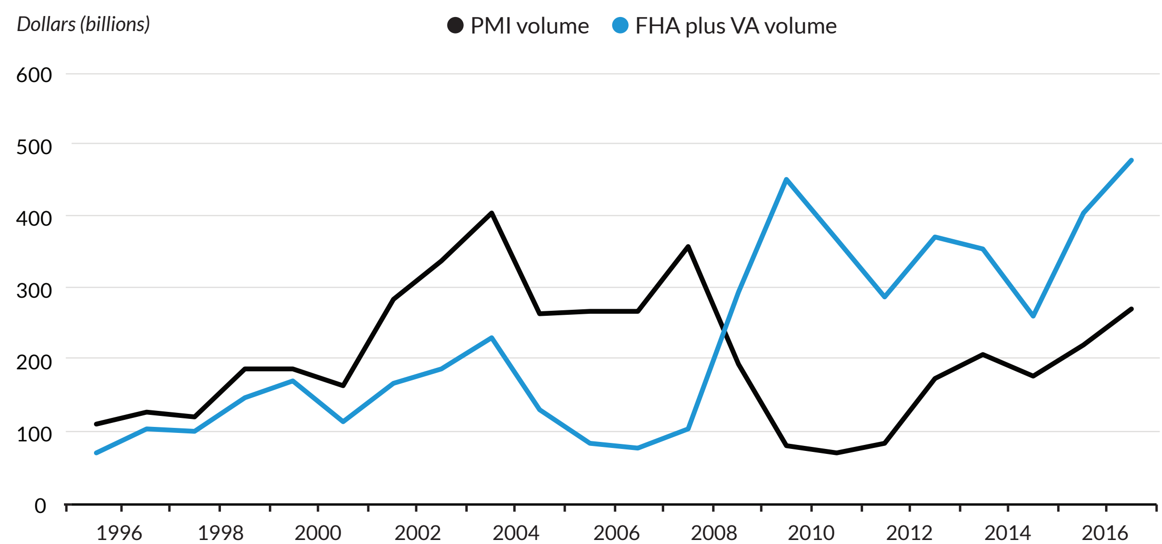
Sources: Inside Mortgage Finance and Urban Institute.

Notes: FHA = Federal Housing Administration; VA = US Department of Veteran Affairs.

Mortgage Insurance Market Share based on Loan Count, 1972–2015



Annual Mortgage Insurance Volume: PMI versus FHA/VA



Agency Mortgage Market

GSE Mortgages: PMI versus Non-PMI

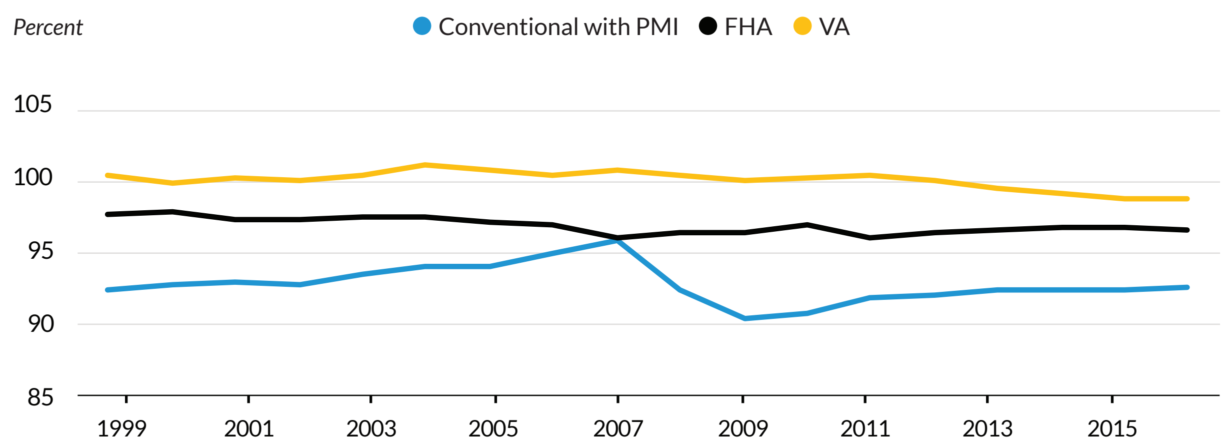
Private mortgage insurance borrowers tend to have lower credit scores and higher LTV and DTI ratios than non-PMI borrowers in the conventional market. For 2016 originations, 24.9 percent of GSE loans had PMI. The share was higher for purchase loans (44.7 percent) than for refinance (refi) loans (9.4 percent). The average balance of a GSE PMI loan is about 2 percent larger than for a GSE loan without PMI. But the average value of a home where the borrower has PMI is $257,548, compared with $366,268 for borrowers without PMI. Private mortgage insurance borrowers take out larger loans relative to the property's value than non-PMI borrowers. Private mortgage insurance borrowers average 92 percent LTV versus 66.7 percent LTV for GSE borrowers without PMI.

Sources: eMBS and the Urban Institute.
Notes: DTI = debt-to-income ratio; FRM 30 = 30-year fixed-rate mortgage; LTV = loan-to-value ratio; PMI = private mortgage insurance. Home Affordable Refinance Program loans are accounted as refinances.

All

	% of All Loans		Loan ($ thousands)		Note Rate (%)		Purchase (%)		FRM 30 (%)		LTV (%)		FICO		DTI (%)	
	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
2013	18.1	81.9	210.1	201.4	4.1	3.8	55.0	23.1	84.6	60.9	96.9	70.5	743	751	33.9	32.3
2014	25.4	74.6	216.7	205.9	4.4	4.2	77.2	40.4	88.4	64.8	93.0	69.5	741	745	34.6	33.7
2015	24.8	75.2	228.1	219.4	4.1	3.9	77.1	34.2	89.9	66.3	92.3	67.7	744	749	34.4	33.3
2016	24.9	75.1	237.3	231.9	3.9	3.7	78.8	32.3	90.8	67.1	92.0	66.7	744	750	34.7	33.2

Average LTVs: FHA, PMI, VA



PMI versus FHA and VA

For 2016 originations, 48.8 percent of agency mortgages had mortgage insurance (PMI, FHA, or VA). Of these insured mortgages, 33.4 percent had PMI coverage, 41.1 percent were FHA insured, and 25.5 percent were VA insured. The loan amount for mortgages with PMI, at $237,300, was larger than for FHA mortgages ($198,300) and smaller than for VA mortgages ($255,200). In the purchase market, 64.4 percent of agency loans had mortgage insurance, with PMI composing 40.2 percent of the total. Purchase loans with PMI had an average LTV ratio of 92.9 percent, lower than the FHA's 95.3 percent or the VA's 97.6 percent. Private mortgage insurance borrowers also had higher FICO scores and lower DTI ratios than their FHA and VA counterparts in 2016.

Sources: eMBS and the Urban Institute.
Notes: DTI = debt-to-income ratio; FHA = Federal Housing Administration; LTV = loan-to-value ratio; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Home Affordable Refinance Program loans are counted as refinances. Percentages of all loans may not sum to 100 because of

All

		% of All Loans			Loan ($ thousands)				Note Rate (%)		
	% of loans with mortgage insurance	PMI	FHA	VA	All	PMI	FHA	VA	PMI	FHA	VA
2013	37.0	36.3	42.9	20.8	100	210.1	175.5	221.2	4.1	3.8	3.6
2014	45.9	37.7	38.1	24.2	100	216.7	173.3	231.2	4.4	4.2	4.0
2015	49.1	32.6	45.1	22.4	100	228.1	195.3	243.9	4.1	4.0	3.7
2016	48.8	33.4	41.1	25.5	100	237.3	198.3	255.2	3.9	3.8	3.5

Purchase

		% of All Loans			Loan ($ thousands)			
	% of loans with mortgage insurance	PMI	FHA	VA	All	PMI	FHA	VA
2013	55.7	36.6	46.1	17.4	100	223.5	179.3	234.2
2014	58.2	40.4	40.5	19.1	100	220.5	177.9	236.4
2015	63.5	37.8	44.7	17.5	100	227.7	190.8	245.0
2016	64.4	40.2	42.4	17.4	100	235.1	197.8	254.2

Refi

		% of All Loans			Loan ($ thousands)			
	% of loans with mortgage insurance	PMI	FHA	VA	All	PMI	FHA	VA
2013	26.4	35.9	39.1	25.0	100	193.8	170.2	210.4
2014	29.6	30.8	32.1	37.2	100	203.6	158.1	224.2
2015	33.9	22.3	45.8	32.0	100	229.5	203.8	242.8
2016	33.5	20.5	38.5	41.0	100	245.5	199.3	256.0

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Purchase (%)			LTV (%)			FICO			DTI (%)		
PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA
55.0	58.6	45.5	96.9	92.0	95.1	743	697	718	33.9	38.2	35.8
77.2	76.6	57.1	93.0	92.6	95.2	741	680	707	34.6	40.2	38.2
77.1	65.9	52.0	92.3	92.6	94.9	744	684	708	34.4	40.1	38.2
78.8	67.6	44.6	92.0	92.3	94.5	744	681	710	34.7	40.7	38.4

Note Rate (%)			LTV (%)			FICO			DTI (%)		
PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA
4.2	3.9	3.8	93.0	95.3	98.0	750	692	715	34.0	40.4	38.3
4.4	4.2	4.1	92.8	95.2	97.6	744	682	711	34.6	40.7	38.8
4.1	4.0	3.8	92.8	95.3	97.7	744	684	711	34.6	40.5	39.1
3.9	3.8	3.6	92.9	95.3	97.6	743	682	711	34.9	41.0	39.4

Note Rate (%)			LTV (%)			FICO			DTI (%)		
PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA	PMI	FHA	VA
3.9	3.8	3.5	101.8	87.3	85.8	734	705	720	33.9	33.2	32.0
4.4	4.3	3.9	93.7	83.8	87.5	731	676	702	34.8	37.5	36.7
4.0	3.9	3.6	90.5	86.9	87.3	743	683	706	33.8	38.4	36.4
3.8	3.7	3.4	88.8	85.1	86.9	746	679	709	33.7	39.4	36.5

State-Level Analysis: All Loans

For 2016 agency originations, 48.9 percent had mortgage insurance. Of these, 33.4 percent had PMI, and the remaining 66.6 percent were insured by the FHA or VA. The PMI share ranged from 21.5 percent in Hawaii to 53.9 percent in Wisconsin. States with a PMI share under 26 percent are Alaska, California, Hawaii, Mississippi, Nevada, and Virginia. States with a PMI share over 50 percent include the District of Columbia, Iowa, Minnesota, and Vermont.

Sources: eMBS and the Urban Institute.
Notes: Data based on agency issuance in 2016. National numbers also include Guam, Puerto Rico, and the Virgin Islands.

State	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
	PMI	FHA	VA	PMI	FHA	VA	All	
National	33.4	41.1	25.5	1,051,717	1,295,350	805,063	3,152,130	48.9
Alabama	28.6	40.6	30.8	13,930	19,763	15,019	48,712	61.9
Alaska	23.3	26.1	50.6	2,010	2,251	4,356	8,617	58.4
Arizona	30.8	41.2	28.1	35,607	47,641	32,474	115,722	54.8
Arkansas	31.8	41.4	26.8	7,831	10,214	6,601	24,646	55.8
California	25.6	45.3	29.2	81,417	144,079	92,835	318,331	34.3
Colorado	28.9	37.0	34.2	28,016	35,897	33,153	97,066	43.0
Connecticut	40.5	45.9	13.5	11,315	12,822	3,774	27,911	51.7
Delaware	30.9	43.3	25.8	3,742	5,242	3,123	12,107	52.3
District of Columbia	55.5	24.7	19.8	2,388	1,065	853	4,306	33.9
Florida	29.1	43.0	28.0	65,462	96,777	63,086	225,325	54.5
Georgia	28.4	43.8	27.8	35,733	55,132	35,000	125,865	58.5
Hawaii	21.5	11.3	67.2	2,244	1,174	7,000	10,418	42.4
Idaho	38.3	36.4	25.3	10,460	9,932	6,915	27,307	54.6
Illinois	46.2	40.5	13.3	51,768	45,420	14,870	112,058	45.7
Indiana	35.8	46.4	17.8	25,756	33,424	12,831	72,011	57.2
Iowa	50.7	31.0	18.4	13,000	7,948	4,716	25,664	45.9
Kansas	39.8	36.7	23.5	10,894	10,031	6,430	27,355	56.8
Kentucky	30.2	45.7	24.1	11,199	16,955	8,950	37,104	52.9
Louisiana	31.3	44.0	24.7	11,275	15,874	8,893	36,042	54.2
Maine	33.9	37.8	28.3	3,190	3,556	2,664	9,410	47.3
Maryland	28.6	43.8	27.6	23,327	35,668	22,495	81,490	57.3
Massachusetts	46.9	38.2	14.9	23,073	18,796	7,302	49,171	37.3
Michigan	44.0	40.9	15.1	41,536	38,607	14,271	94,414	47.3
Minnesota	50.4	34.0	15.6	33,599	22,644	10,387	66,630	47.5
Mississippi	25.9	47.8	26.3	5,047	9,317	5,130	19,494	58.4

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State	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
	PMI	FHA	VA	PMI	FHA	VA	All	
Missouri	36.8	42.3	20.8	24,596	28,257	13,903	66,756	52.2
Montana	38.4	28.3	33.3	3,892	2,874	3,372	10,138	43.8
Nebraska	41.6	33.6	24.8	8,460	6,835	5,054	20,349	51.7
Nevada	24.6	45.9	29.4	12,518	23,315	14,952	50,785	56.5
New Hampshire	39.0	39.1	21.9	5,721	5,742	3,222	14,685	49.1
New Jersey	35.3	53.2	11.6	23,889	36,025	7,847	67,761	44.7
New Mexico	26.3	41.7	32.0	5,613	8,902	6,818	21,333	60.5
New York	36.3	50.6	13.1	25,934	36,158	9,328	71,420	41.9
North Carolina	35.1	30.7	34.2	37,066	32,463	36,123	105,652	52.9
North Dakota	43.2	28.1	28.7	2,362	1,540	1,571	5,473	44.0
Ohio	37.0	45.0	17.9	39,981	48,615	19,365	107,961	57.4
Oklahoma	29.3	42.8	28.0	10,084	14,730	9,641	34,455	58.0
Oregon	36.1	33.7	30.1	17,092	15,971	14,261	47,324	41.2
Pennsylvania	36.0	46.5	17.5	35,141	45,389	17,097	97,627	53.7
Rhode Island	31.6	53.9	14.5	3,183	5,419	1,459	10,061	51.7
South Carolina	32.3	35.5	32.3	18,639	20,490	18,664	57,793	55.9
South Dakota	40.3	30.9	28.7	3,253	2,496	2,319	8,068	48.4
Tennessee	29.8	40.7	29.5	21,235	29,070	21,035	71,340	55.6
Texas	31.1	43.2	25.7	78,733	109,362	65,221	253,316	52.4
Utah	39.2	42.9	17.9	20,667	22,579	9,437	52,683	50.4
Vermont	50.3	27.4	22.3	1,943	1,058	861	3,862	39.8
Virginia	25.3	31.7	42.9	29,541	37,029	50,069	116,639	56.9
Washington	34.1	31.6	34.3	34,052	31,602	34,285	99,939	47.0
West Virginia	28.7	40.0	31.3	2,688	3,749	2,937	9,374	52.9
Wisconsin	53.9	29.0	17.1	28,729	15,472	9,090	53,291	43.9
Wyoming	31.6	33.2	35.2	2,085	2,190	2,325	6,600	49.0

State-Level Analysis: Purchase

For 2016 agency purchase originations, 64.4 percent had mortgage insurance. Of these, 40.2 percent had PMI, and 59.8 percent were insured by the FHA or VA. There is substantial variability in PMI share by state, ranging from 28.9 percent in Alaska to 69 percent in the District of Columbia.

Sources: eMBS and the Urban Institute.
Notes: Data based on agency issuance in 2016. National numbers also include Guam, Puerto Rico, and the Virgin Islands.

	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
State	PMI	FHA	VA	PMI	FHA	VA	All	
National	40.2	42.4	17.4	828,741	875,944	359,185	2,063,870	64.4
Alabama	34.9	43.5	21.6	10,623	13,243	6,564	30,430	69.8
Alaska	28.9	29.8	41.3	1,641	1,690	2,342	5,673	73.0
Arizona	39.3	42.6	18.1	28,297	30,647	12,988	71,932	67.5
Arkansas	36.3	44.5	19.2	6,167	7,557	3,268	16,992	64.0
California	34.5	49.4	16.1	58,242	83,408	27,245	168,895	59.1
Colorado	41.1	36.7	22.2	23,121	20,639	12,512	56,272	60.2
Connecticut	45.5	44.8	9.7	8,796	8,652	1,864	19,312	65.9
Delaware	36.5	46.5	17.0	2,607	3,315	1,213	7,135	60.2
District of Columbia	69.0	19.8	11.2	1,922	552	311	2,785	54.2
Florida	35.4	44.8	19.8	57,834	73,293	32,362	163,489	64.9
Georgia	34.4	45.6	20.0	28,203	37,429	16,420	82,052	70.0
Hawaii	36.6	13.2	50.2	1,863	674	2,553	5,090	54.2
Idaho	44.8	37.7	17.5	8,713	7,345	3,406	19,464	66.0
Illinois	50.6	40.0	9.4	38,576	30,535	7,170	76,281	63.8
Indiana	41.4	46.8	11.8	20,570	23,284	5,878	49,732	68.6
Iowa	56.5	30.4	13.1	10,321	5,559	2,388	18,268	60.5
Kansas	45.1	37.1	17.8	8,492	6,976	3,351	18,819	69.7
Kentucky	35.3	47.7	17.0	8,761	11,821	4,223	24,805	62.5
Louisiana	36.3	46.5	17.2	8,625	11,028	4,082	23,735	65.2
Maine	39.7	39.6	20.7	2,473	2,468	1,287	6,228	57.7
Maryland	34.4	47.3	18.3	15,902	21,839	8,446	46,187	71.5
Massachusetts	52.5	38.5	9.0	17,189	12,583	2,941	32,713	58.9
Michigan	50.6	39.4	9.9	32,614	25,397	6,397	64,408	64.5
Minnesota	56.0	34.1	9.9	26,675	16,237	4,714	47,626	64.5
Mississippi	27.3	51.6	21.1	3,578	6,777	2,774	13,129	67.9

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	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
State	PMI	FHA	VA	PMI	FHA	VA	All	
Missouri	41.5	42.6	15.8	18,157	18,631	6,919	43,707	65.1
Montana	48.0	28.3	23.6	3,244	1,913	1,596	6,753	57.0
Nebraska	47.1	34.6	18.3	6,737	4,951	2,624	14,312	67.6
Nevada	31.3	48.7	20.0	10,081	15,670	6,456	32,207	70.3
New Hampshire	43.1	41.5	15.4	4,163	4,013	1,485	9,661	62.9
New Jersey	41.0	51.3	7.6	17,631	22,061	3,281	42,973	58.4
New Mexico	32.6	44.4	23.0	4,232	5,767	2,984	12,983	71.2
New York	41.0	49.2	9.8	21,440	25,728	5,122	52,290	55.3
North Carolina	44.2	30.9	24.9	29,879	20,861	16,821	67,561	62.4
North Dakota	54.4	24.8	20.8	1,999	911	764	3,674	60.2
Ohio	42.3	44.8	12.8	32,158	34,043	9,754	75,955	70.0
Oklahoma	32.3	45.9	21.8	7,881	11,220	5,333	24,434	67.0
Oregon	47.1	35.2	17.8	14,414	10,764	5,437	30,615	56.5
Pennsylvania	41.4	46.8	11.8	27,426	31,026	7,808	66,260	65.7
Rhode Island	33.5	56.6	9.9	2,299	3,887	676	6,862	67.5
South Carolina	38.5	37.6	23.8	15,212	14,872	9,418	39,502	64.7
South Dakota	46.4	32.1	21.5	2,658	1,837	1,232	5,727	61.6
Tennessee	36.8	41.8	21.4	17,088	19,447	9,947	46,482	63.2
Texas	35.7	44.9	19.4	68,533	86,075	37,264	191,872	66.6
Utah	44.1	44.2	11.8	15,414	15,450	4,126	34,990	67.6
Vermont	57.9	25.9	16.2	1,563	698	438	2,699	54.7
Virginia	31.4	36.6	32.0	20,696	24,088	21,087	65,871	68.5
Washington	44.0	33.2	22.7	27,855	21,027	14,383	63,265	64.6
West Virginia	35.7	40.4	23.8	2,112	2,389	1,407	5,908	61.0
Wisconsin	61.9	26.3	11.8	22,019	9,377	4,204	35,600	60.5
Wyoming	39.4	32.2	28.4	1,522	1,242	1,095	3,859	59.6

State-Level Analysis: Refinance

For 2016 agency refinance originations, 33.5 percent had mortgage insurance. Of these, 20.5 percent had PMI, and 79.5 percent were either FHA or VA insured. The PMI share ranged from 7.2 percent in Hawaii to 37.9 percent in Wisconsin. Illinois, Iowa, Massachusetts, and Minnesota had PMI shares over 35 percent.

Sources: eMBS and the Urban Institute.

Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Data based on agency issuance in 2016. National numbers also include Guam, Puerto Rico, and the Virgin Islands.

	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
State	PMI	FHA	VA	PMI	FHA	VA	All	
National	20.5	38.5	41.0	222,976	419,406	445,878	1,088,260	33.5
Alabama	18.1	35.7	46.2	3,307	6,520	8,455	18,282	52.0
Alaska	12.5	19.1	68.4	369	561	2,014	2,944	42.1
Arizona	16.7	38.8	44.5	7,310	16,994	19,486	43,790	41.9
Arkansas	21.7	34.7	43.5	1,664	2,657	3,333	7,654	43.3
California	15.5	40.6	43.9	23,175	60,671	65,590	149,436	23.2
Colorado	12.0	37.4	50.6	4,895	15,258	20,641	40,794	30.9
Connecticut	29.3	48.5	22.2	2,519	4,170	1,910	8,599	34.8
Delaware	22.8	38.8	38.4	1,135	1,927	1,910	4,972	43.9
District of Columbia	30.6	33.7	35.6	466	513	542	1,521	20.1
Florida	12.3	38.0	49.7	7,628	23,484	30,724	61,836	38.3
Georgia	17.2	40.4	42.4	7,530	17,703	18,580	43,813	44.7
Hawaii	7.2	9.4	83.5	381	500	4,447	5,328	35.1
Idaho	22.3	33.0	44.7	1,747	2,587	3,509	7,843	38.3
Illinois	36.9	41.6	21.5	13,192	14,885	7,700	35,777	28.5
Indiana	23.3	45.5	31.2	5,186	10,140	6,953	22,279	41.7
Iowa	36.2	32.3	31.5	2,679	2,389	2,328	7,396	28.8
Kansas	28.1	35.8	36.1	2,402	3,055	3,079	8,536	40.3
Kentucky	19.8	41.7	38.4	2,438	5,134	4,727	12,299	40.4
Louisiana	21.5	39.4	39.1	2,650	4,846	4,811	12,307	41.0
Maine	22.5	34.2	43.3	717	1,088	1,377	3,182	35.0
Maryland	21.0	39.2	39.8	7,425	13,829	14,049	35,303	45.4
Massachusetts	35.8	37.8	26.5	5,884	6,213	4,361	16,458	21.6
Michigan	29.7	44.0	26.2	8,922	13,210	7,874	30,006	30.1
Minnesota	36.4	33.7	29.9	6,924	6,407	5,673	19,004	28.7
Mississippi	23.1	39.9	37.0	1,469	2,540	2,356	6,365	45.3

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State	% of Borrowers among Loans with Insurance			Number of Loans				% All Agency Loans with Insurance
	PMI	FHA	VA	PMI	FHA	VA	All	
Missouri	27.9	41.8	30.3	6,439	9,626	6,984	23,049	38.0
Montana	19.1	28.4	52.5	648	961	1,776	3,385	29.9
Nebraska	28.5	31.2	40.3	1,723	1,884	2,430	6,037	33.2
Nevada	13.1	41.2	45.7	2,437	7,645	8,496	18,578	42.2
New Hampshire	31.0	34.4	34.6	1,558	1,729	1,737	5,024	34.5
New Jersey	25.2	56.3	18.4	6,258	13,964	4,566	24,788	31.8
New Mexico	16.5	37.5	45.9	1,381	3,135	3,834	8,350	49.0
New York	23.5	54.5	22.0	4,494	10,430	4,206	19,130	25.2
North Carolina	18.9	30.5	50.7	7,187	11,602	19,302	38,091	41.7
North Dakota	20.2	35.0	44.9	363	629	807	1,799	28.3
Ohio	24.4	45.5	30.0	7,823	14,572	9,611	32,006	40.2
Oklahoma	22.0	35.0	43.0	2,203	3,510	4,308	10,021	43.7
Oregon	16.0	31.2	52.8	2,678	5,207	8,824	16,709	27.6
Pennsylvania	24.6	45.8	29.6	7,715	14,363	9,289	31,367	38.7
Rhode Island	27.6	47.9	24.5	884	1,532	783	3,199	34.4
South Carolina	18.7	30.7	50.5	3,427	5,618	9,246	18,291	43.3
South Dakota	25.4	28.2	46.4	595	659	1,087	2,341	31.8
Tennessee	16.7	38.7	44.6	4,147	9,623	11,088	24,858	45.3
Texas	16.6	37.9	45.5	10,200	23,287	27,957	61,444	31.4
Utah	29.7	40.3	30.0	5,253	7,129	5,311	17,693	33.6
Vermont	32.7	31.0	36.4	380	360	423	1,163	24.4
Virginia	17.4	25.5	57.1	8,845	12,941	28,982	50,768	46.7
Washington	16.9	28.8	54.3	6,197	10,575	19,902	36,674	32.0
West Virginia	16.6	39.2	44.1	576	1,360	1,530	3,466	43.1
Wisconsin	37.9	34.5	27.6	6,710	6,095	4,886	17,691	28.3
Wyoming	20.5	34.6	44.9	563	948	1,230	2,741	39.2

Credit Box Distribution: FICO

In 2016, PMI borrowers had higher median FICO scores than FHA and VA borrowers, but lower FICO scores than GSE borrowers without PMI. The median FICO score was 748 for PMI purchase borrowers, 676 for FHA borrowers, and 707 for VA borrowers. Over half (56.5 percent) of PMI purchase borrowers had FICO scores at or above 740, compared with 13.2 percent of FHA borrowers and 34.7 percent VA borrowers. A majority (52.5 percent) of FHA borrowers had FICO scores below 680, while 34.1 percent of VA borrowers and 8.2 percent of PMI borrowers were in this range.

Sources: eMBS and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. "Other" refers to loans insured by the US Department of Housing and Urban Development's Office of Public and Indian Housing and the US Department of Agriculture's Rural Development. Data based on agency issuance in 2016.

All

	Loans	≤619	620–679	680–739	≥740	All	Median	Mean
All	6,306,415	1.4	17.4	29.8	51.3	100	737	730.1
PMI	1,051,478	0.1	7.8	34.6	57.4	100	749	743.7
FHA	1,231,141	5.4	47.5	34.2	12.9	100	676	681.2
VA	726,459	2.9	30.1	32.8	34.2	100	708	710.0
GSE non-PMI	3,176,715	0.5	9.2	26.2	64.1	100	762	750.4
Other	120,622	1.5	39.3	38.8	20.5	100	692	698.2

Purchase

	Loans	≤619	620–679	680–739	≥740	All	Median	Mean
All	3,203,794	1.6	21.2	30.8	46.4	100	729	725.7
PMI	828,504	0.0	8.2	35.3	56.5	100	748	743.1
FHA	874,473	5.0	47.5	34.4	13.2	100	676	682.2
VA	358,749	3.0	31.1	31.2	34.7	100	707	711.0
GSE non-PMI	1,024,657	0.0	7.2	23.6	69.2	100	770	757.0
Other	117,411	1.4	39.5	38.8	20.3	100	692	698.0

Refi

	Loans	≤619	620–679	680–739	≥740	All	Median	Mean
All	3,102,621	1.2	13.1	28.7	57.0	100	744	734.7
PMI	222,974	0.6	6.3	32.2	60.9	100	752	745.7
FHA	356,668	7.6	47.6	33.1	11.7	100	676	678.8
VA	367,710	2.9	27.5	36.6	33.0	100	708	708.9
GSE non-PMI	2,152,058	0.7	10.2	27.5	61.6	100	758	747.2
Other	3,211	3.9	27.5	39.6	29.0	100	702	706.0

Credit Box Distribution: LTV

In 2016, PMI borrowers had lower median LTV ratios than FHA and VA borrowers, but higher LTV ratios than GSE borrowers without PMI. The median LTV was 95 percent for PMI purchase borrowers, 96.5 percent for FHA borrowers, and 100 percent for VA borrowers. Most FHA and VA purchase borrowers, 86.1 and 82.2 percent, respectively, had LTV ratios over 95 percent, and 89.7 percent of PMI borrowers had LTV ratios ranging from 80.01 to 95 percent.

Sources: eMBS and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; LTV = loan-to-value ratio; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. "Other" refers to loans insured by the US Department of Housing and Urban Development's Office of Public and Indian Housing and the US Department of Agriculture's Rural Development. Data based on agency issuance in 2016.

All

	Loans	≤80%	80.01–90%	90.01–95%	≥95.01%	All	Median	Mean
All	5,889,207	56.4	11.3	11.3	21.0	100	80.0	78.8
PMI	1,051,717	-	42.3	48.8	8.8	100	95.0	92.0
FHA	1,080,408	7.4	12.9	7.2	72.5	100	96.5	92.3
VA	459,196	10.1	11.3	10.0	68.6	100	99.4	94.5
GSE non-PMI	3,176,435	98.3	0.7	0.3	0.7	100	72.0	66.7
Other	121,451	1.0	2.8	4.2	92.1	100	101.6	100.3

Purchase

	Loans	≤80%	80.01–90%	90.01–95%	≥95.01%	All	Median	Mean
All	3,055,937	34.3	11.2	18.0	36.4	100	95.0	87.5
PMI	828,741	-	34.0	55.7	10.3	100	95.0	92.9
FHA	760,613	2.2	4.8	7.0	86.1	100	96.5	95.3
VA	324,215	4.0	5.9	7.9	82.2	100	100.0	97.6
GSE non-PMI	1,024,417	98.8	0.2	0.2	0.9	100	80.0	72.5
Other	117,951	0.8	2.4	4.0	92.8	100	101.9	100.5

Refi

	Loans	≤80%	80.01–90%	90.01–95%	≥95.01%	All	Median	Mean
All	2,833,270	82.0	11.3	3.5	3.3	100	73.0	69.4
PMI	222,976	-	73.6	23.0	3.3	100	88.0	88.8
FHA	319,795	31.8	50.6	8.4	9.2	100	86.1	85.1
VA	134,981	24.8	24.2	14.9	36.0	100	90.5	86.9
GSE non-PMI	2,152,018	98.1	0.9	0.3	0.7	100	68.0	63.9
Other	3,500	12.3	22.1	15.4	50.2	100	96.6	92.3

Credit Box Distribution: DTI

In 2016, PMI borrowers had lower median DTI ratios than FHA and VA borrowers, but slightly higher DTI ratios than GSE borrowers without PMI. The median DTI was 36 percent for PMI purchase borrowers, 41.9 percent for FHA borrowers, and 40.0 percent for VA borrowers. Most PMI purchase borrowers, 51.8 percent, had DTI ratios up to 36 percent, and the corresponding shares for FHA and VA purchase borrowers were 28.3 and 35.3, respectively. In addition, 44.4 percent and 38 percent of FHA and VA borrowers, respectively, had DTI ratios over 43 percent in 2016, compared with 14.1 percent of PMI borrowers.

Sources: eMBS and the Urban Institute.
Notes: DTI = debt-to-income ratio; FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. "Other" refers to loans insured by the US Department of Housing and Urban Development's Office of Public and Indian Housing and the US Department of Agriculture's Rural Development. Data based on agency issuance in 2016.

All

	Loans	≤36%	36.01–43%	43.01–48%	≥48.01%	All	Median	Mean
All	5,915,148	50.8	27.5	14.0	7.7	50.8	36.0	35.3
PMI	1,049,376	53.3	33.0	12.5	1.2	53.3	36.0	34.7
FHA	1,070,377	29.5	26.8	19.6	24.0	29.5	41.7	40.7
VA	553,529	36.7	26.1	17.4	19.8	36.7	39.2	38.4
GSE non-PMI	3,136,632	58.2	25.8	12.5	3.5	58.2	34.0	33.2
Other	105,234	51.2	38.5	10.1	0.3	51.2	35.8	34.8

Purchase

	Loans	≤36%	36.01–43%	43.01–48%	≥48.01%	All	Median	Mean
All	3,186,446	45.9	29.0	15.5	9.6	100	37.8	36.6
PMI	828,690	51.8	34.1	13.1	1.0	100	36.0	34.9
FHA	873,183	28.3	27.3	20.1	24.3	100	41.9	41.0
VA	356,797	35.3	26.7	17.9	20.1	100	40.0	39.4
GSE non-PMI	1,024,680	56.9	25.9	13.7	3.5	100	34.0	33.4
Other	103,096	50.8	38.8	10.2	0.2	100	35.8	34.9

Refi

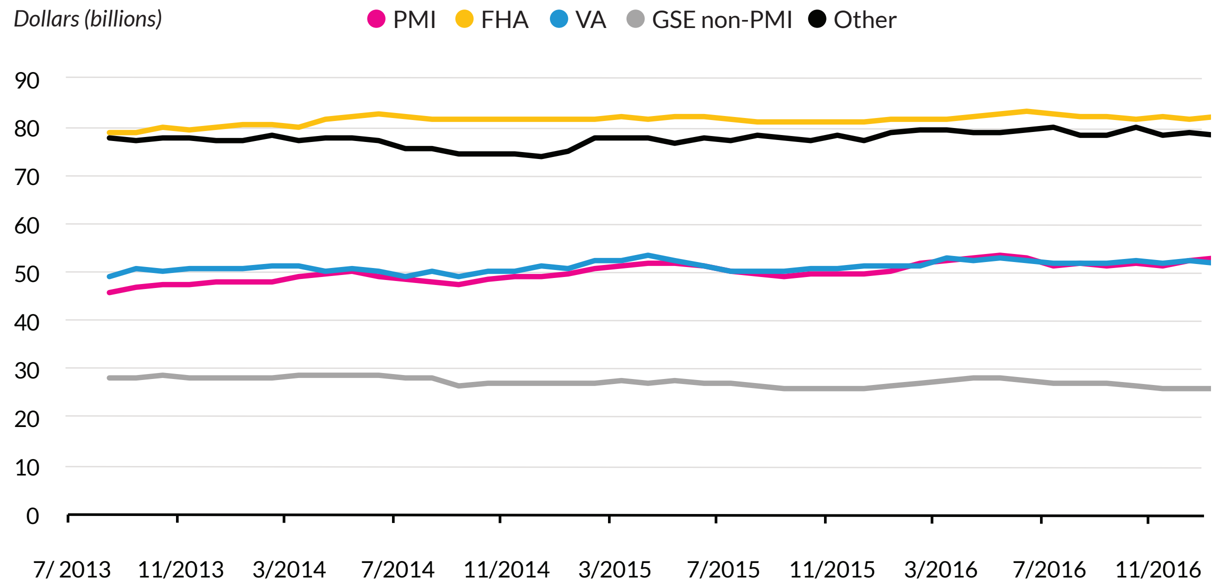
	Loans	≤36%	36.01–43%	43.01–48%	≥48.01%	All	Median	Mean
All	2,728,702	56.4	25.9	12.3	5.4	100	35.0	33.9
PMI	220,686	59.1	29.1	10.0	1.9	100	34.0	33.7
FHA	197,194	35.1	24.8	17.4	22.8	100	40.4	39.4
VA	196,732	40.0	24.7	16.3	19.0	100	37.2	36.5
GSE non-PMI	2,111,952	58.8	25.7	11.9	3.5	100	34.0	33.1
Other	2,138	68.2	22.6	4.4	4.8	100	30.0	29.8

Credit Box: First-Time Homebuyer

Within the agency purchase market in December 2016, 52.9 percent of PMI borrowers, 82 percent of FHA borrowers, 52 percent of VA borrowers, and 26.3 percent of non-PMI GSE borrowers were first-time homebuyers. For 2016 originations, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan, have a lower credit score, have a higher LTV ratio, and have a slightly lower DTI ratio, thus requiring a higher interest rate.

Sources: eMBS, FHA, and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. "Other" refers to loans insured by the US Department of Housing and Urban Development's Office of Public and Indian Housing and the US Department of Agriculture's Rural Development. Data based on agency originations in 2016.

Annual Mortgage Insurance Volume: PMI versus FHA/VA



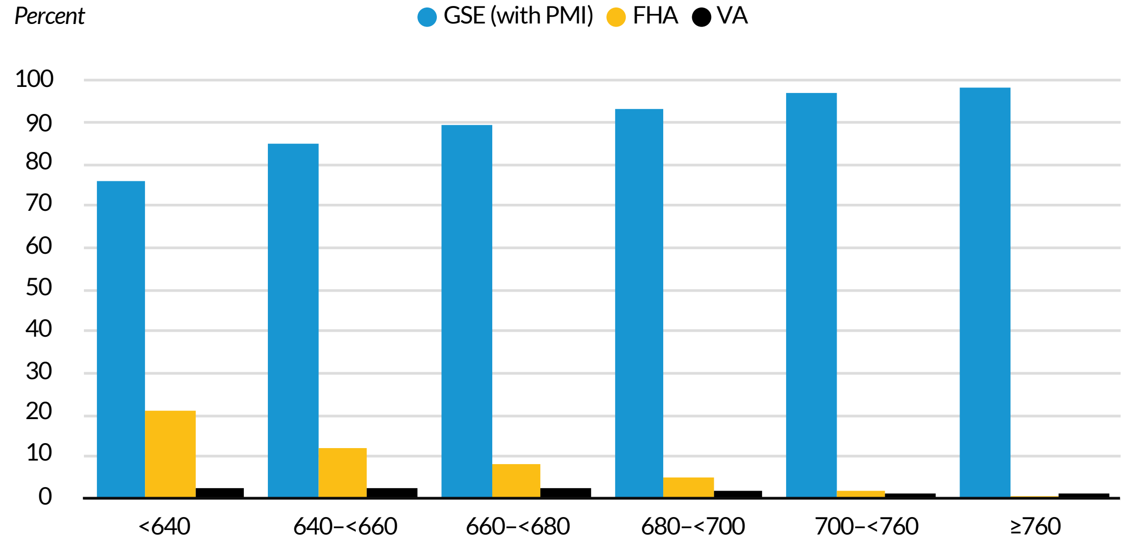
	PMI		FHA		VA		GSE Non-PMI		Other	
	First-time	Repeat	First-time	Repeat	First-time	Repeat	First-time	Repeat	First-time	Repeat
Loan amount ($ thousands)	222.5	253.7	191.5	215.7	231.5	279.0	230.0	246.3	139.7	156.3
FICO score	738.9	747.3	680.4	687.1	698.4	724.8	743.9	760.8	695.8	706.4
LTV (%)	93.5	92.6	95.6	94.6	98.8	96.3	75.5	70.6	100.6	100.4
DTI (%)	34.3	35.6	40.8	41.7	38.9	40.0	32.8	33.7	34.8	35.1
Note rate (%)	3.9	3.8	3.8	3.7	3.7	3.6	3.8	3.7	3.7	3.7

Channel by FICO/ LTV: All Loans

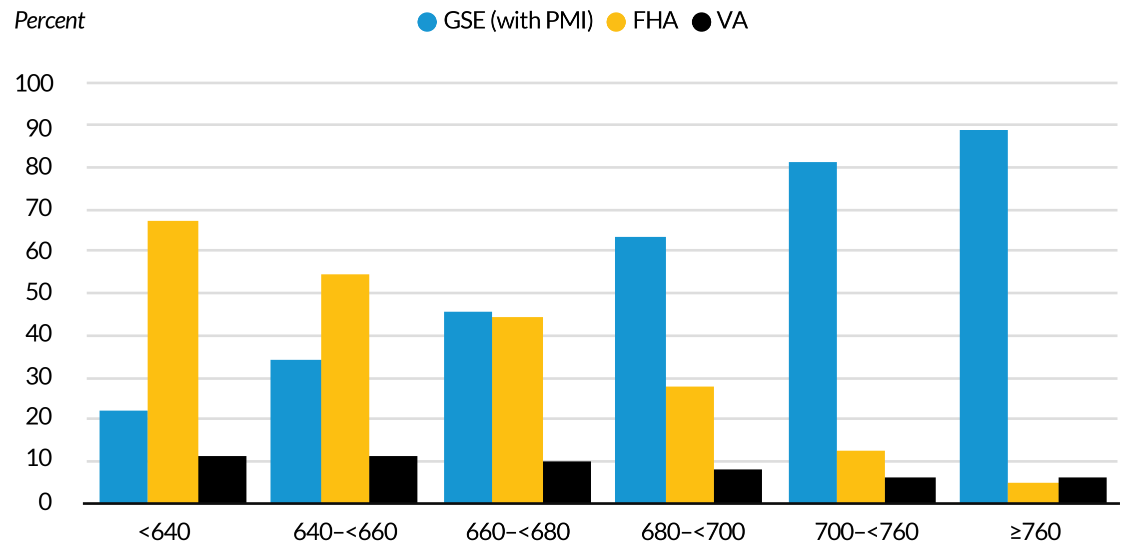
For 2016 originations, borrowers with LTV ratios ≤80 percent, were highly likely to choose non-PMI GSE mortgages over any other channel regardless of FICO score. Borrowers with LTVs from 80.01 to 95 percent and FICO scores above 680 were more likely to choose GSE loans with PMI over FHA or VA loans. Borrowers with FICO scores below 660 were more likely to choose FHA loans over PMI or VA loans, regardless of LTV ratio. Federal Housing Administration loans dominated the 95.01-to-97 LTV market, as borrowers in this LTV band were more likely to choose FHA loans over PMI loans, regardless of FICO score. In the above-97 LTV market, VA loans dominated.

Sources: eMBS and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Data based on agency originations in 2016.

FICO Distribution by Channel for LTV ≤80



FICO Distribution by Channel for LTV 80.01–95



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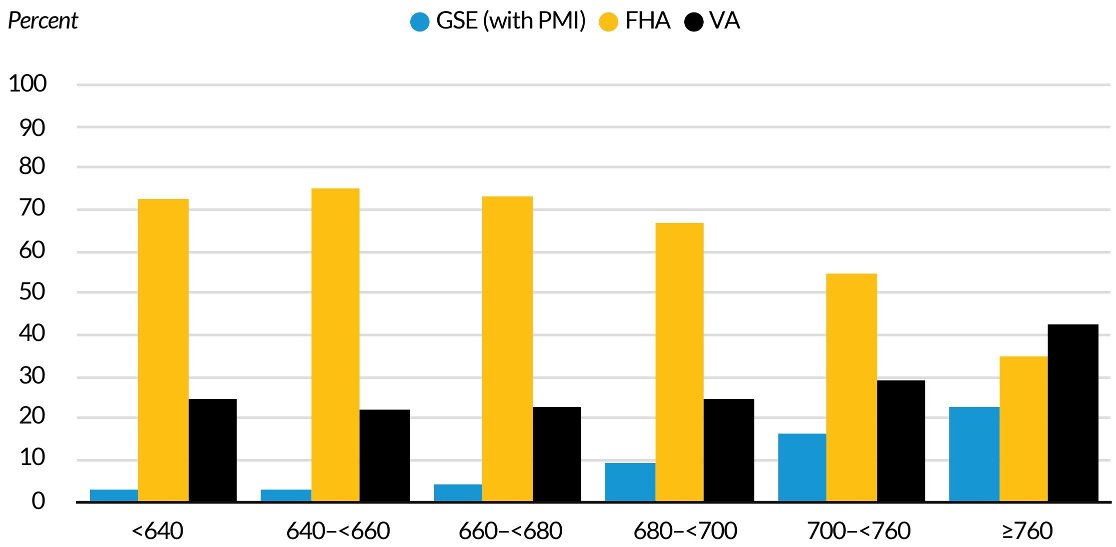
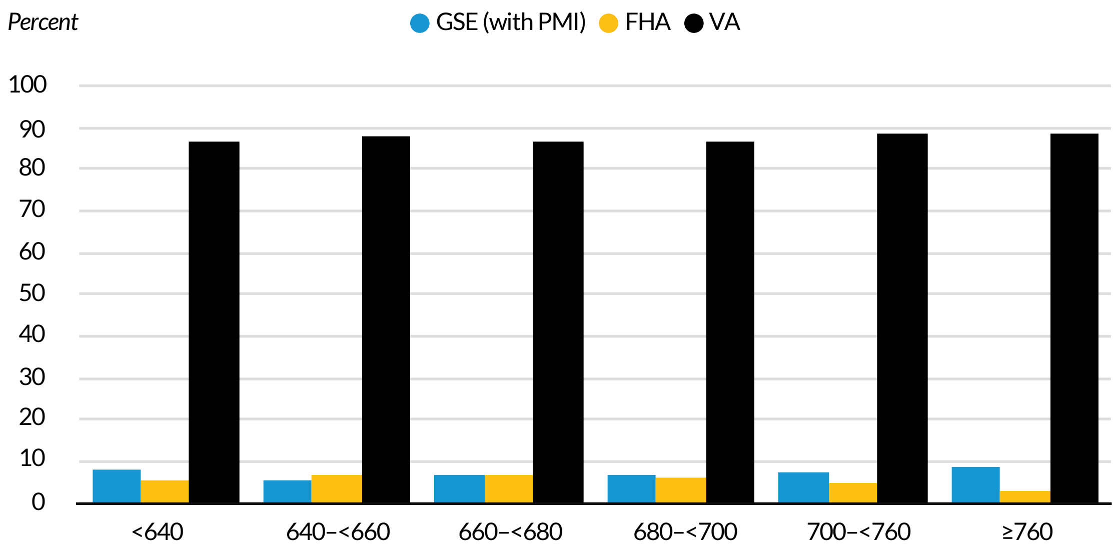
FICO Distribution by Channel for LTV 95.01–97



FICO Distribution by Channel for LTV >97

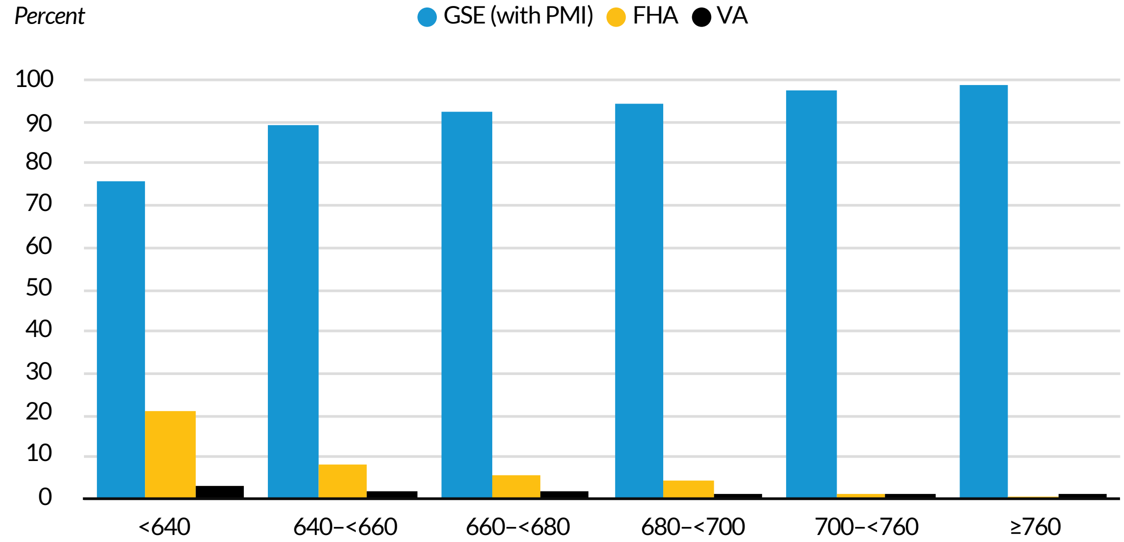


Channel by FICO/ LTV: Purchase

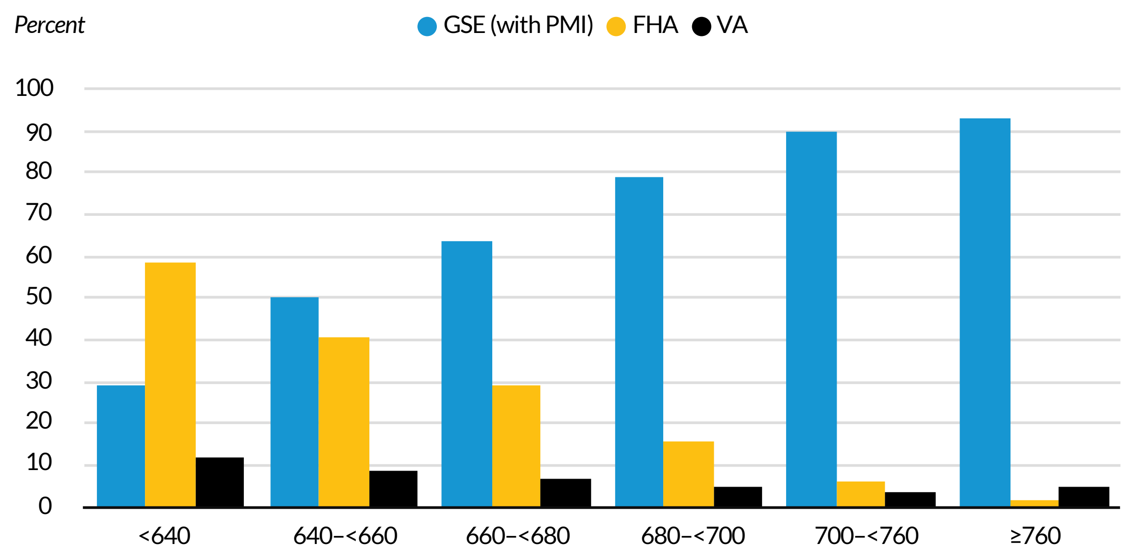
For 2016 purchase originations, borrowers with LTV ratios ≤80 percent were highly likely to choose non-PMI GSE mortgages over any other channel regardless of FICO score. Borrowers with LTVs from 80.01 to 95 percent and FICO scores above 640 were more likely to choose GSE loans with PMI over FHA or VA loans. Borrowers with FICO scores below 640 were more likely to choose FHA loans over PMI or VA loans. Borrowers with LTV ratios from 95.01 to 97 percent were more likely to choose FHA loans over PMI loans, regardless of FICO score. In the over-97 LTV market, VA loans dominate.

Sources: eMBS and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Data based on agency originations in 2016.

FICO Distribution by Channel for LTV ≤80



FICO Distribution by Channel for LTV 80.01–95



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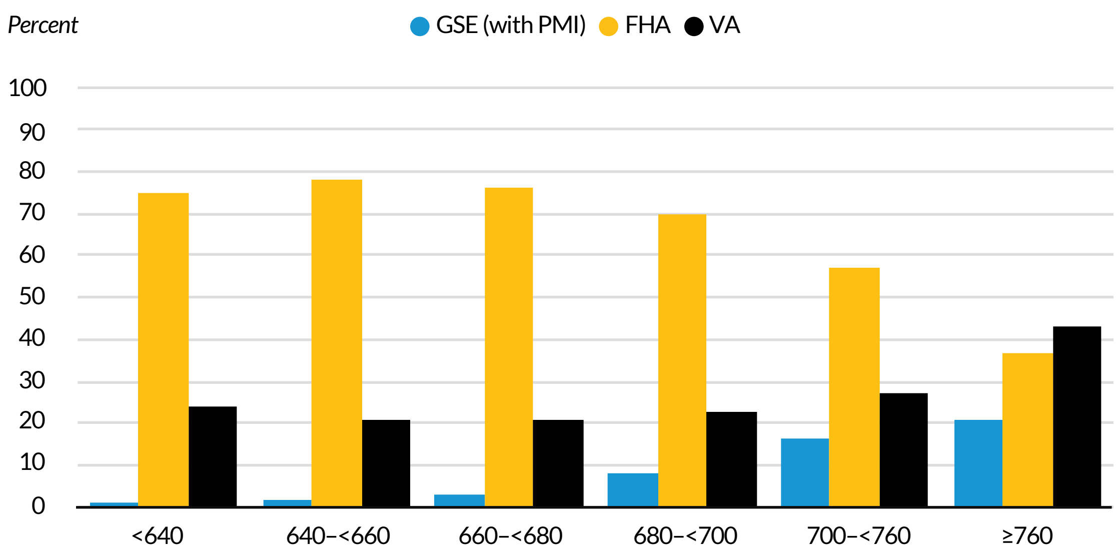
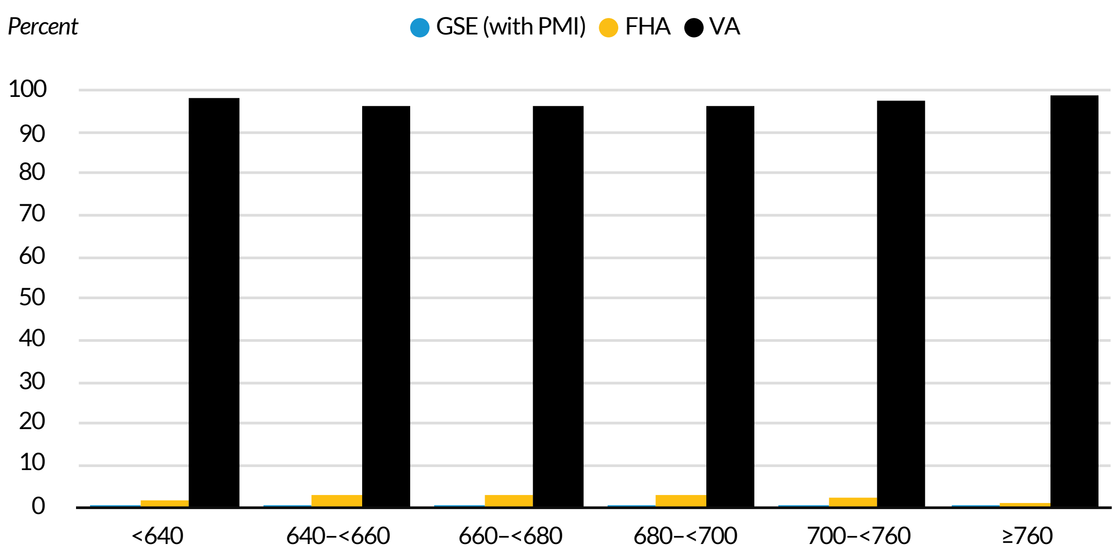
FICO Distribution by Channel for LTV 95.01–97



FICO Distribution by Channel for LTV >97



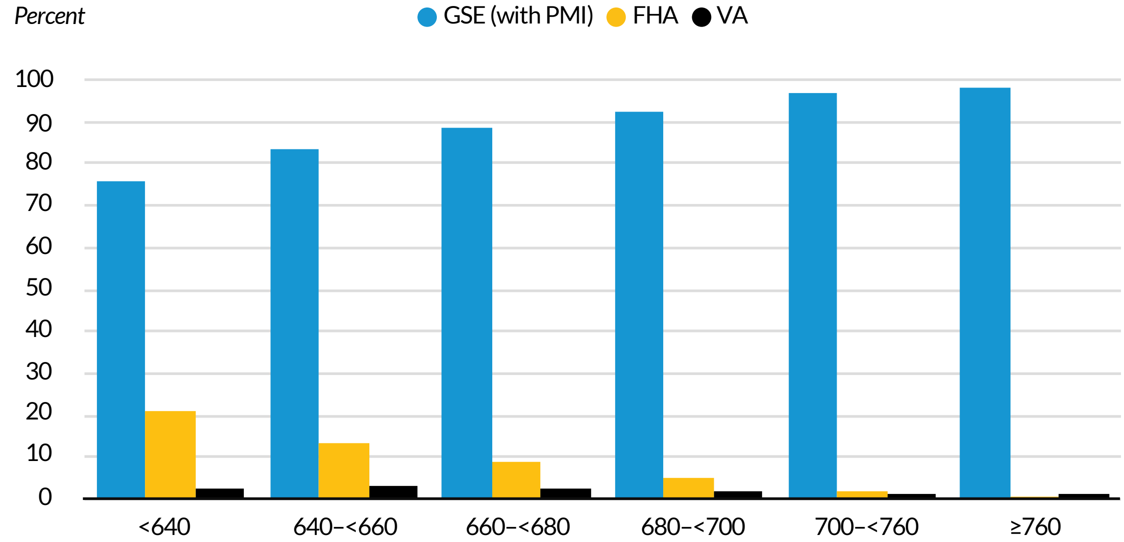
Agency Mortgage Market

Channel by FICO/ LTV: Refinance

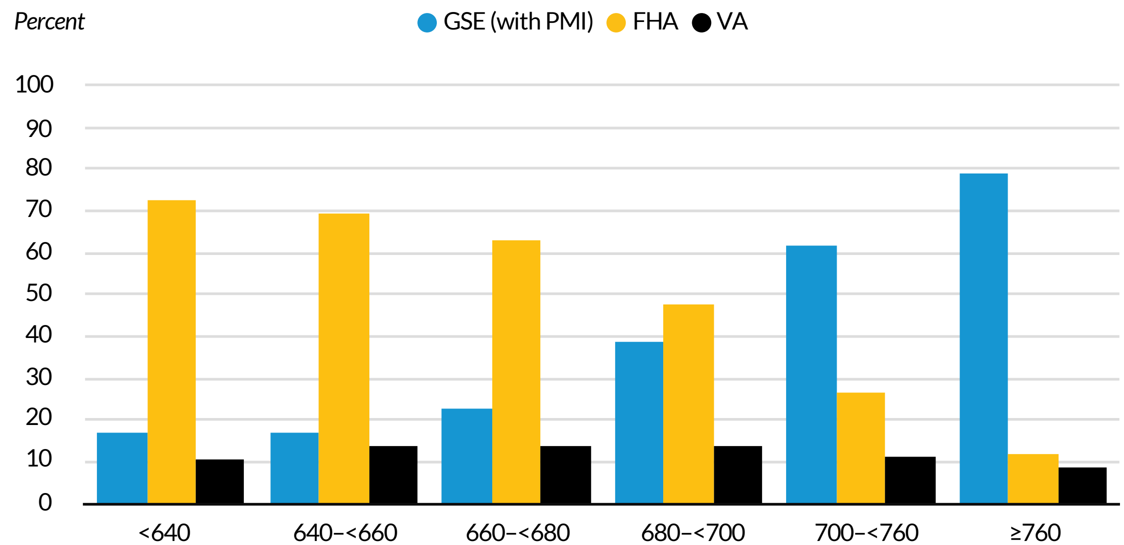
For 2016 refinance originations, borrowers with LTV ratios ≤80 percent were highly likely to choose non-PMI GSE mortgages over any other channel regardless of FICO score. Borrowers with LTVs from 80.01 to 95 percent and FICO scores above 700 and were more likely to choose GSE loans with PMI over FHA or VA loans. Those with FICOs below 700 were more likely to take out FHA mortgages over PMI or VA. Borrowers with LTV ratios from 95.01 to 97 percent and FICOs below 700 were more likely to choose FHA over PMI or VA. Those with FICOs above 700 were more likely to choose VA over the other two channels. In the over-97 LTV market, VA loans dominate

Sources: eMBS and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Data based on agency originations in 2016.

FICO Distribution by Channel for LTV ≤80



FICO Distribution by Channel for LTV 80.01–95



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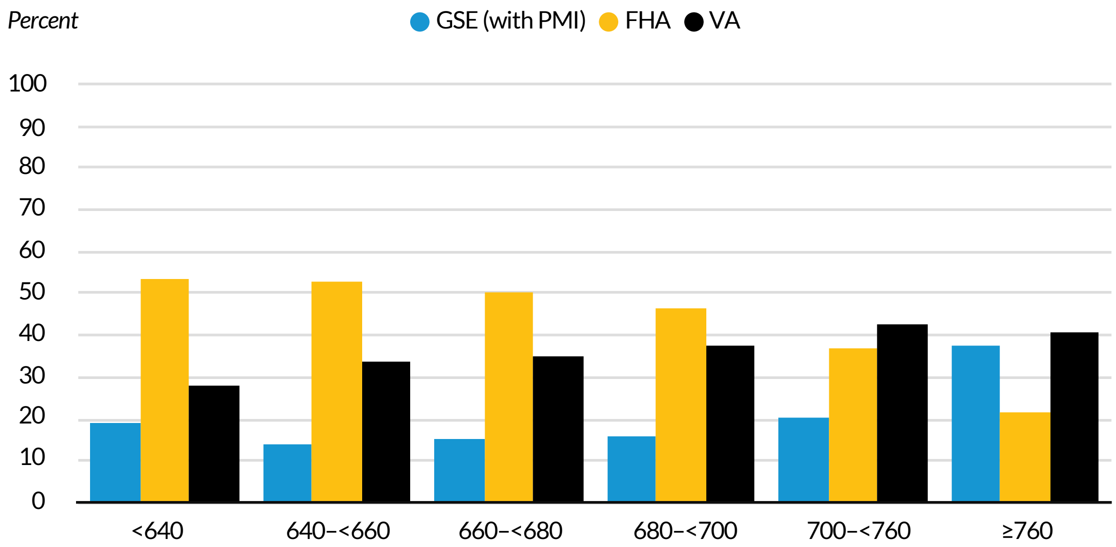
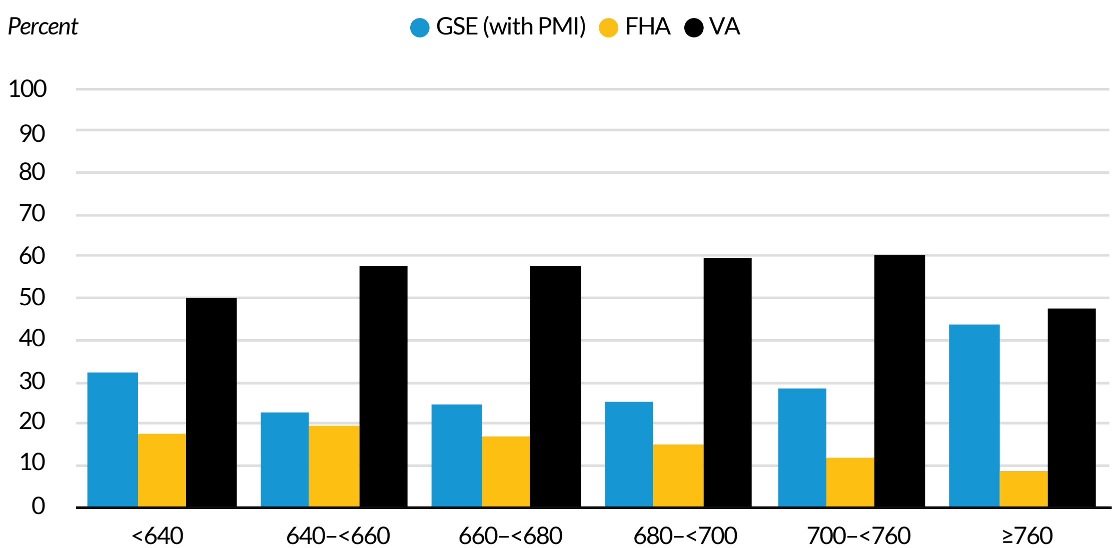
FICO Distribution by Channel for LTV 95.01–97



FICO Distribution by Channel for LTV>97



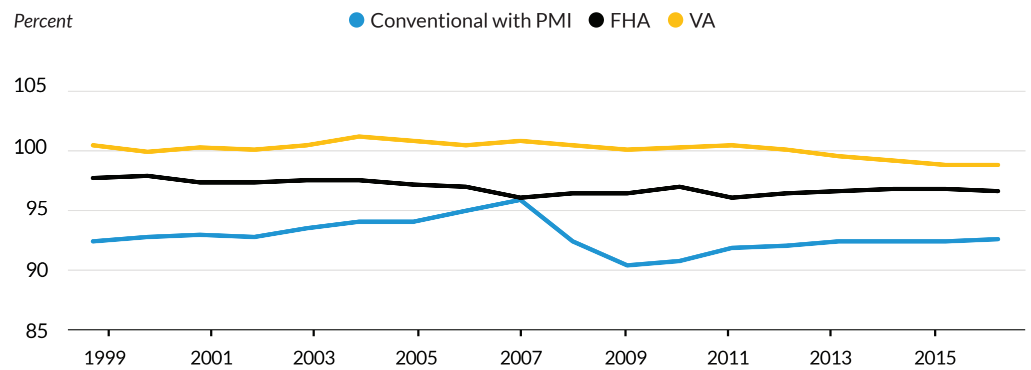
Servicing Data

Average LTV, DTI, FICO Trends

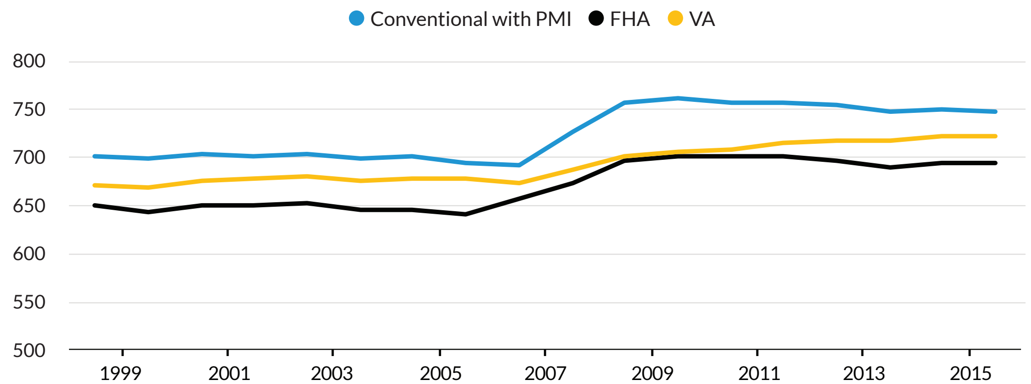
Conventional loans with PMI have higher FICO scores and lower LTV ratios than FHA or VA loans. Postcrisis, conventional loans with PMI have exhibited lower DTI ratios than FHA- and VA-insured loans.

Sources: CoreLogic Servicing and the Urban Institute.
Notes: DTI = debt-to-income ratio; FHA = Federal Housing Administration; LTV = loan-to-value ratio; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Private-label securities are excluded. "Conventional with PMI" include government-sponsored enterprise and portfolio loans with and without PMI. Based on purchase loans only.

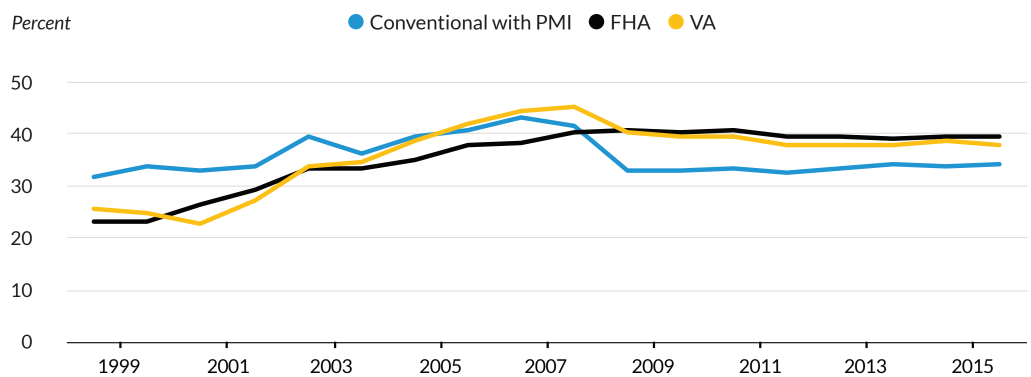
Average LTVs: FHA, PMI, VA



Average FICO Score: FHA, PMI, VA



Average DTI Ratios: FHA, PMI, VA



Loan Composition

CoreLogic servicing data (which include agency issuance plus bank portfolio loans) show that from 1999 to 2016, 74.2 percent of loans originated were conventional loans without PMI, 7.7 percent were conventional loans with PMI, 12.8 percent were FHA loans, and 3.5 percent were VA loans. Conventional loans without MI have larger balances than loans with MI (jumbo loans are less likely to have MI). In recent years, conventional loans with PMI hade lower FICO scores, similar DTI ratios, and higher LTV ratios than conventional loans without MI.

Sources: CoreLogic Servicing and the Urban Institute.
Notes: DTI = debt-to-income ratio; FHA = Federal Housing Administration; LTV = loan-to-value ratio; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Private-label securities are excluded. "Conventional PMI" and "Conventional non-PMI" include government-sponsored enterprise and portfolio loans with and without PMI. "Other" refers to loans insured by the US Department of Housing and Urban Development's Office of Public and Indian Health and the US Department of Agriculture's Rural Development.

		% of all loans	Loan ($ thousands)	Note rate (%)	LTV	FICO	DTI
1999–2004	Conventional PMI	8.8	115.2	6.7	95.5	642.1	29.1
	FHA	2.2	130.3	6.5	98.5	661.3	31.0
	VA	79.7	169.9	6.3	68.9	712.8	30.8
	Conventional non-PMI	1.3	159.1	7.5	84.5	658.5	34.1
	Other	100.0	161.7	6.4	73.9	703.6	31.2
	All	5.3	157.5	6.1	92.5	696.2	39.4
2005	Conventional PMI	4.7	129.0	6.1	93.6	633.9	31.9
	FHA	1.5	157.1	5.8	99.3	669.4	38.4
	VA	86.9	222.8	5.8	71.8	707.6	36.7
	Conventional non-PMI	1.6	200.6	7.0	85.2	670.5	35.6
	Other	100.0	213.6	5.9	74.5	702.3	36.7
	All	8.7	168.4	6.6	93.2	691.7	40.2
2006	Conventional PMI	5.6	137.6	6.5	94.0	635.2	36.9
	FHA	1.7	180.9	6.4	99.0	672.9	42.0
	VA	83.3	238.5	6.6	71.5	705.8	37.0
	Conventional non-PMI	0.7	252.3	6.3	74.5	722.9	22.7
	Other	100.0	225.9	6.6	75.2	700.1	37.3
	All	13.3	181.9	6.7	93.9	688.6	41.9
2007	Conventional PMI	8.4	157.6	6.6	93.7	644.9	38.6
	FHA	1.7	188.1	6.3	99.7	669.9	44.2
	VA	75.6	242.2	6.7	71.3	712.2	37.2
	Conventional non-PMI	1.0	311.4	6.2	79.8	715.1	26.9
	Other	100.0	226.8	6.6	76.7	702.7	37.9
	All	100.0	226.8	6.6	76.7	702.7	37.9

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		% of all loans	Loan ($ thousands)	Note rate (%)	LTV	FICO	DTI
2008	Conventional PMI	10.4	208.1	6.2	91.2	724.4	41.2
	FHA	26.7	175.6	6.2	94.3	664.3	40.4
	VA	3.1	203.9	6.0	99.2	684.9	44.9
	Conventional non-PMI	57.5	235.5	6.0	66.9	738.3	36.4
	Other	2.3	237.7	5.9	84.7	699.6	32.9
	All	100.0	215.7	6.1	78.1	714.6	38.0
2009–10	Conventional PMI	3.4	222.5	4.9	90.8	753.7	34.4
	FHA	27.1	182.1	5.0	94.6	696.3	40.1
	VA	4.4	206.9	4.8	97.9	704.1	39.4
	Conventional non-PMI	62.7	235.0	4.8	65.5	760.9	34.2
	Other	2.4	202.5	5.0	87.5	708.5	33.7
	All	100.0	218.2	4.9	76.2	739.4	35.9
2011–16	Conventional PMI	7.9	219.1	4.1	95.1	746.0	36.0
	FHA	14.5	174.7	4.0	93.5	699.5	39.1
	VA	6.8	225.0	3.8	94.7	718.0	38.0
	Conventional non-PMI	67.9	246.4	4.0	69.1	755.9	35.5
	Other	2.9	186.7	3.9	92.5	717.3	34.5
	All	100.0	230.7	4.0	77.1	743.3	36.1
All	Conventional PMI	7.7	175.8	5.8	92.7	713.1	37.9
	FHA	12.8	157.7	5.5	94.4	673.8	38.0
	VA	3.5	193.1	4.9	96.8	695.9	38.2
	Conventional non-PMI	74.2	209.9	5.6	69.1	727.1	34.4
	Other	1.8	191.4	5.5	87.7	695.5	33.7
	All	100.0	199.7	5.6	75.4	717.6	35.2

Defaults: 90+ Days Delinquent

Conventional loans with PMI originated from 1999 to 2016 have exhibited a higher likelihood of going 90 or more days delinquent than their non-PMI counterparts (13.4 versus 8.1 percent). Conventional loans with PMI have lower default rates than FHA loans, but higher default rates than VA loans over this period. By origination year groupings, conventional loans with PMI have exhibited lower default rates than FHA loans in every period. Conventional loans with PMI have lower default rates than VA loans for all years except 2005 through 2008.

Sources: CoreLogic Servicing and the Urban Institute.
Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; UPB = unpaid principal balance; VA = US Department of Veterans Affairs. Private-label securities are excluded. "Conventional with PMI" include government-sponsored enterprise and portfolio loans with and without PMI. "D90+" = 90 or more days delinquent, including loans in foreclosure or real estate owned.

		D90+ (by loan count)	D90+ (by UPB)
1999–2004	Conventional PMI	10.4%	8.6%
	FHA	18.4%	15.7%
	VA	11.3%	9.3%
	Conventional non-PMI	6.2%	4.7%
	Other	10.8%	8.2%
	All	7.8%	5.8%
2005	Conventional PMI	22.3%	21.9%
	FHA	29.3%	26.8%
	VA	18.7%	17.2%
	Conventional non-PMI	16.5%	16.4%
	Other	9.4%	6.7%
	All	17.3%	16.7%
2006	Conventional PMI	30.9%	32.3%
	FHA	34.8%	33.2%
	VA	19.2%	17.5%
	Conventional non-PMI	24.4%	25.6%
	Other	13.0%	12.2%
	All	25.4%	26.1%
2007	Conventional PMI	36.3%	38.9%
	FHA	36.6%	36.2%
	VA	18.6%	16.8%
	Conventional non-PMI	24.5%	25.9%
	Other	27.1%	23.4%
	All	27.0%	27.7%

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		D90+ (by loan count)	D90+ (by UPB)
2008	Conventional PMI	21.0%	22.4%
	FHA	27.0%	25.6%
	VA	14.5%	12.9%
	Conventional non-PMI	10.1%	10.2%
	Other	22.8%	13.2%
	All	16.2%	14.9%
2009–10	Conventional PMI	3.6%	3.3%
	FHA	14.1%	13.0%
	VA	9.5%	8.4%
	Conventional non-PMI	2.0%	1.7%
	Other	16.6%	9.7%
	All	6.0%	4.8%
2011–16	Conventional PMI	1.2%	1.0%
	FHA	5.3%	4.7%
	VA	2.8%	2.2%
	Conventional non-PMI	0.7%	0.5%
	Other	5.8%	4.0%
	All	1.7%	1.2%
All	Conventional PMI	13.4%	12.7%
	FHA	16.1%	14.3%
	VA	7.9%	6.2%
	Conventional non-PMI	8.1%	7.9%
	Other	11.1%	8.2%
	All	9.6%	8.8%

Private-Label Securities

Composition

For non-agency residential mortgage-backed securities from 1999 to 2016, only 10.9 percent of loans have PMI coverage. Loans with PMI tend to have smaller sizes and are more likely to be purchase loans, have higher LTV ratios, and have slightly lower FICO scores compared with non-PMI PLS loans. Debt-to-income ratio information is excluded from this table because of missing values in the database and overstated incomes during the 2005–07 period.

Sources: CoreLogic Servicing and the Urban Institute.

Notes: LTV = loan-to-value ratio; PLS = private-label securities; PMI = private mortgage insurance.

Loan Count and Percentage for PLS Loans by PMI Category

	Loan Count		Percentage	
Origination year	PMI	Non-PMI	PMI	Non-PMI
1999–2004	1,574,477	8,926,255	15.0	85.0
2005	402,725	4,635,777	8.0	92.0
2006	249,083	4,131,376	5.7	94.3
2007	80,649	1,108,297	6.8	93.2
2008	558	18,529	2.9	97.1
2009–10	125	8,288	1.5	98.5
2011–16	47	72,940	0.1	99.9
All	2,307,664	18,901,462	10.9	89.1

Origination Loan Characteristics by PMI Category

	Loan ($ thousands)		Note Rate (%)		Purchase (%)		LTV (%)		FICO	
Origination year	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
1999–2004	158.0	213.1	8.1	7.6	53.3	36.9	88.5	78.0	649.7	658.7
2005	197.0	227.4	7.0	7.0	48.9	50.8	89.7	79.9	656.4	664.1
2006	233.5	232.2	6.7	8.0	50.3	49.3	90.2	81.2	671.0	663.7
2007	275.4	318.1	6.5	7.3	48.2	37.2	90.1	78.1	687.8	679.8
2008	336.9	212.0	5.8	7.4	58.8	17.1	92.1	75.3	664.2	630.2
2009–10	232.2	269.3	4.9	5.7	51.2	24.1	94.2	73.8	619.8	671.6
2011–16	227.3	644.0	4.4	4.1	57.4	52.3	91.7	70.3	736.1	763.2
All	177.1	228.6	7.7	7.5	52.0	43.1	89.0	79.1	654.5	662.7

Defaults: 90+ Days Delinquent

For non-agency residential mortgage-backed securities from 1999 to 2016, 28.1 percent of loans with PMI went 90 or more days delinquent compared with 32.1 percent of loans without PMI. The bottom table shows the fate of loans that went delinquent for 90 or more days with and without PMI. For loans with PMI, 9.5 percent are current, 7.6 percent are prepaid, 74.3 percent have liquidated, and 8.6 percent are persistently delinquent.

Sources: CoreLogic Servicing and the Urban Institute.
Notes: PMI = private mortgage insurance;
REO = real estate owned.

Loans Ever 90 or More Days Delinquent

	Loan Count		Percentage	
Origination year	PMI	Non-PMI	PMI	Non-PMI
1999–2004	19.3%	16.0%	15.4%	10.3%
2005	36.0%	36.5%	35.7%	33.5%
2006	58.7%	56.8%	62.5%	54.9%
2007	66.5%	53.4%	70.7%	50.1%
2008	45.0%	24.5%	44.2%	22.9%
2009–10	42.4%	19.9%	36.5%	12.4%
2011–16	2.1%	0.5%	1.0%	0.2%
All	28.1%	32.1%	29.1%	29.0%

What Happens to Defaulted Loans?

	Current		Prepay		REO or Foreclosure Alternatives		Persistently Delinquent	
Origination year	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
1999–2004	6.5%	8.3%	13.4%	14.0%	74.1%	70.2%	6.0%	7.5%
2005	11.7%	11.3%	3.5%	3.8%	74.0%	75.7%	10.7%	9.2%
2006	12.3%	12.3%	1.8%	2.3%	75.2%	75.5%	10.7%	9.8%
2007	12.8%	16.8%	1.7%	3.2%	74.0%	67.1%	11.5%	12.9%
2008–16	7.2%	10.7%	18.4%	12.7%	57.7%	45.0%	16.7%	31.7%
All	9.5%	11.5%	7.6%	5.6%	74.3%	73.5%	8.6%	9.4%

Loss Severity

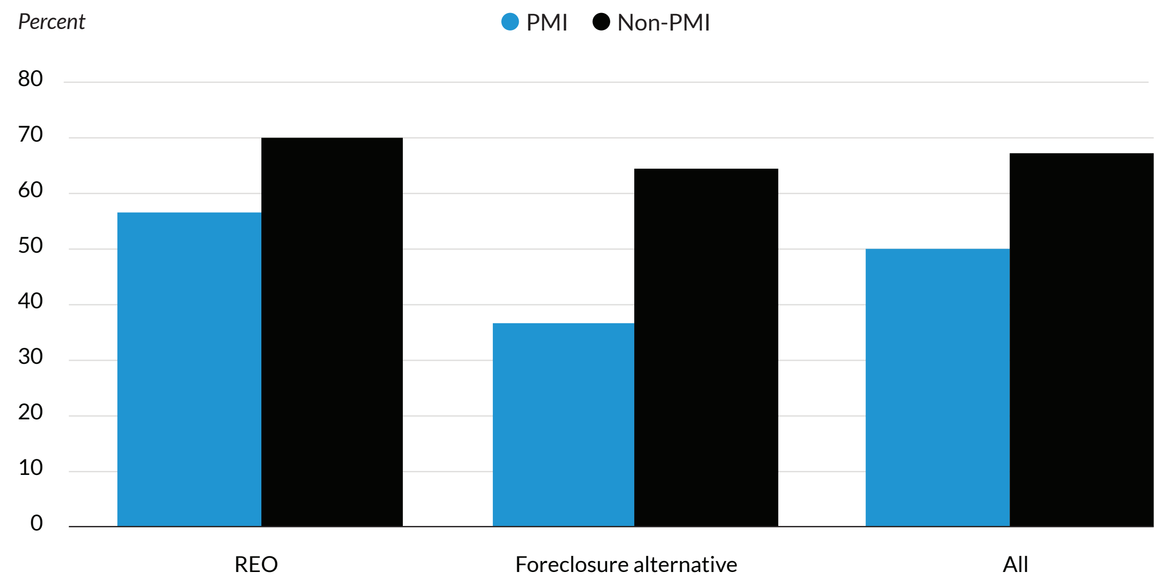
Of the PLS loans that have liquidated, loans with PMI have a lower severity than non-PMI loans, despite having higher LTV ratios, representing the value of PMI recovery. Private mortgage insurance loss severities are lower than non-PMI severities for all origination year buckets for foreclosure alternatives and real estate owned (REO) liquidations.

Sources: CoreLogic Securities and the Urban Institute.
Notes: PMI = private mortgage insurance; REO = real estate owned.

Loans Ever 90 or More Days Delinquent

	Foreclosure Alternatives		REO		Total	
Origination year	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
1999–2004	20.8%	34.1%	43.9%	56.2%	34.4%	44.7%
2005	50.8%	65.8%	59.3%	74.4%	56.9%	70.1%
2006	61.9%	78.2%	68.4%	72.5%	66.6%	75.5%
2007	57.4%	70.0%	71.2%	73.5%	67.5%	71.7%
2008–16	7.0%	25.3%	49.8%	55.9%	16.3%	37.6%
All	36.3%	64.3%	56.4%	69.6%	49.6%	66.9%

Loss Severity for PMI versus Non-PMI loans



GSE Loan-Level Credit Data

Composition

From 1999 to 2015, 20.7 percent of the 30-year fixed-rate, full documentation, fully amortizing loans had private mortgage insurance. This share was as low as 9.1 percent in 2009–10 and was 24.6 percent in 2011–15. The average PMI coverage over the entire period was 24.9 percent. Government-sponsored enterprise loans with PMI are slightly smaller, are more heavily purchase, have a higher LTV ratio, have a lower FICO score, and have a higher DTI ratio than GSE loans without PMI. These data do not include streamlined refinance programs such as the Home Affordable Refinance Program. Thus, this dataset contains a smaller share of refinance loans than do the data used for pages 7 to 25.

Sources: Fannie Mae, Freddie Mac, and the Urban Institute.

Notes: DTI = debt-to-income ratio; GSE = government-sponsored enterprise; LTV = loan-to-value ratio; PMI = private mortgage insurance. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans only. Adjustable-rate mortgages and Freddie Mac's Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

Loan Count and Share for GSE Loans by PMI Category

	Loan Count		Percentage		
Origination year	PMI	Non-PMI	PMI	Non-PMI	Average MI
1999–2004	4,295,949	14,028,274	23.4	76.6	24.5%
2005	360,640	2,080,578	14.8	85.2	24.7%
2006	285,706	1,669,416	14.6	85.4	24.7%
2007	423,682	1,667,615	20.3	79.7	24.7%
2008	447,660	1,692,880	20.9	79.1	23.8%
2009–10	478,885	4,802,284	9.1	90.9	23.0%
2011–15	2,465,212	7,564,681	24.6	75.4	26.3%
All	8,757,734	33,505,728	20.7	79.3	24.9%

Origination Loan Characteristics by PMI Category

	Loan ($ thousands)		Note Rate (%)		Purchase (%)		LTV (%)		FICO		DTI (%)	
Origination year	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
1999–2004	139.0	158.2	6.9	6.5	65.9	33.0	91.1	68.5	703.8	724.2	35.8	33.0
2005	157.3	186.7	6.0	5.9	65.4	40.0	91.2	68.1	707.4	726.0	38.6	36.5
2006	167.0	193.3	6.6	6.4	66.0	45.0	91.2	68.5	706.2	725.1	39.9	37.5
2007	183.2	200.0	6.6	6.4	62.0	39.4	91.4	68.5	707.9	725.9	40.1	37.4
2008	206.1	220.9	6.2	6.1	70.1	36.8	91.0	67.7	733.1	742.3	39.7	37.0
2009–10	217.5	236.3	4.9	4.9	63.6	28.1	90.2	66.2	758.9	763.5	32.7	32.9
2011–15	228.4	239.3	4.2	4.2	79.3	42.0	92.0	68.9	753.6	761.1	33.8	32.9
All	175.7	196.5	5.9	5.7	69.6	35.9	91.3	68.2	722.7	739.3	35.7	33.8

Defaults: 180+ Days Delinquent

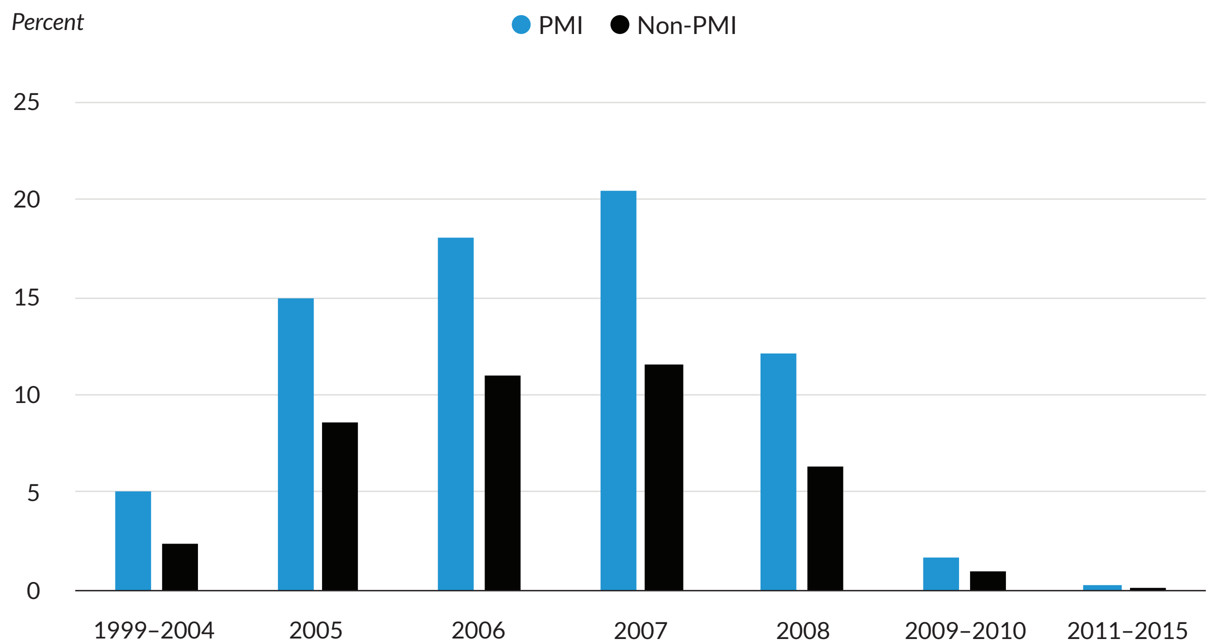
Government-sponsored enterprise loans with PMI coverage tend to go 180 or more days delinquent more frequently than GSE loans without PMI. From 1999 to 2015, 3.2 percent of loans without PMI went 180 or more days delinquent, versus 5.5 percent of loans with PMI. For the highest delinquency issue year, 2007, the shares were 11.6 percent and 20.6 percent, respectively. This is not surprising, as the loans with PMI have higher LTV ratios and weaker credit than non-PMI GSE loans.

Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Notes: D180+ = loans that have been delinquent for 180 or more days; PMI = private mortgage insurance; UPB = unpaid principal balance. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans only. Adjustable-rate mortgages and Freddie Mac's Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016. Default is defined as six months delinquent or disposed of via short sales, third-party sales, deeds-in-lieu of foreclosure, or real-estate-owned acquisitions.

Loans Ever 180 or More Days Delinquent

	D180+ Rates		D180+ Rates (by UPB)	
Origination year	PMI	Non-PMI	PMI	Non-PMI
1999–2004	5.2%	2.5%	4.3%	1.9%
2005	15.0%	8.7%	14.9%	8.3%
2006	18.1%	11.1%	18.7%	11.1%
2007	20.6%	11.6%	21.7%	11.4%
2008	12.2%	6.4%	12.5%	5.8%
2009–10	1.8%	1.0%	1.7%	0.8%
2011–15	0.3%	0.2%	0.3%	0.1%
All	5.5%	3.2%	4.8%	2.8%

Historical Default Rates (D180+) for GSE Loans by Origination Year



Defaulted Loans and Loss Severity

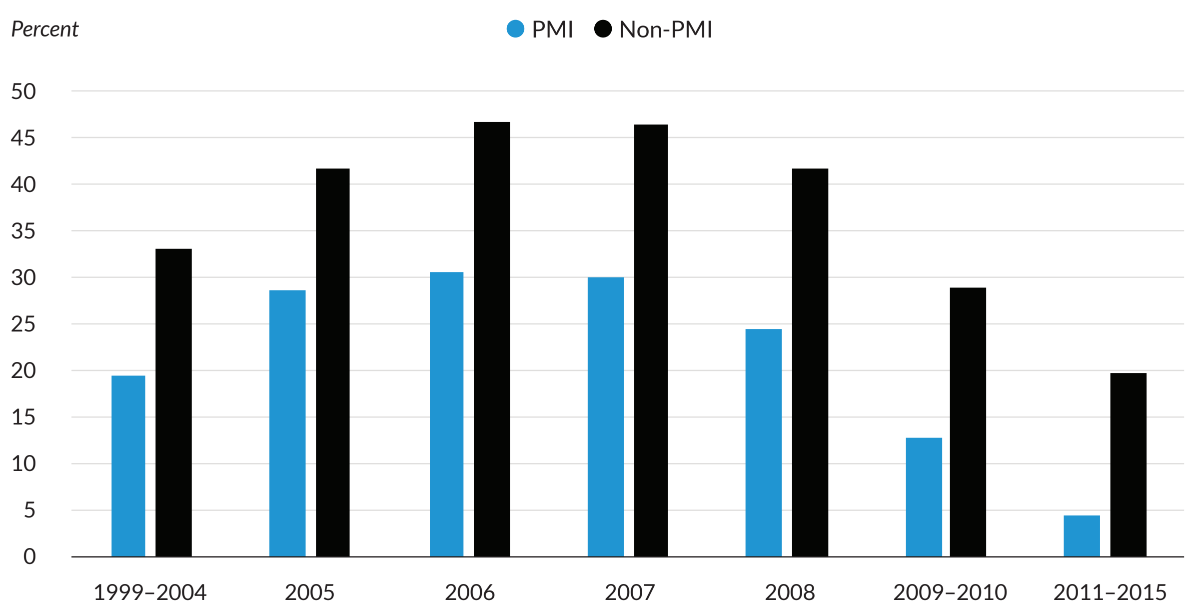
Once more than 180 days delinquent, GSE loans with PMI are marginally less likely to become current or prepaid and are more likely to liquidate. From 1999 to 2015, 65.7 percent of GSE loans with PMI were liquidated, versus 56.1 percent of loans without PMI. However, once the loan is liquidated (REO or foreclosure alternative), the actual severity experienced by the GSEs is lower for loans with PMI than those without, because MI recoveries help reduce losses.

Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Notes: PMI = private mortgage insurance; REO = real estate owned. The GSE credit data is limited to 30-year fixed-rate fully amortizing, full documentation mortgage loans only. ARMs and Relief refinance mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

What Happens to Defaulted Loans?

	Current		Prepay		REO or Foreclosure Alternatives		Persistently Delinquent	
Origination year	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI	PMI	Non-PMI
1999–2004	11.5%	15.6%	14.0%	20.0%	65.5%	52.8%	9.0%	11.6%
2005	14.0%	18.6%	5.2%	8.5%	69.7%	61.2%	11.2%	11.7%
2006	14.3%	18.7%	4.4%	6.9%	69.8%	62.9%	11.4%	11.5%
2007	16.3%	21.1%	4.5%	7.5%	66.7%	58.8%	12.5%	12.7%
2008	19.3%	22.1%	5.7%	10.2%	62.4%	52.4%	12.5%	15.3%
2009–10	13.2%	18.3%	6.3%	14.9%	62.6%	42.7%	17.8%	24.1%
2011–15	12.9%	18.0%	7.9%	14.8%	28.9%	20.6%	50.4%	46.6%
All	13.8%	18.4%	9.2%	12.3%	65.7%	56.1%	11.3%	13.2%

Loss Severity for GSE Loans with and without PMI



Loss Severity

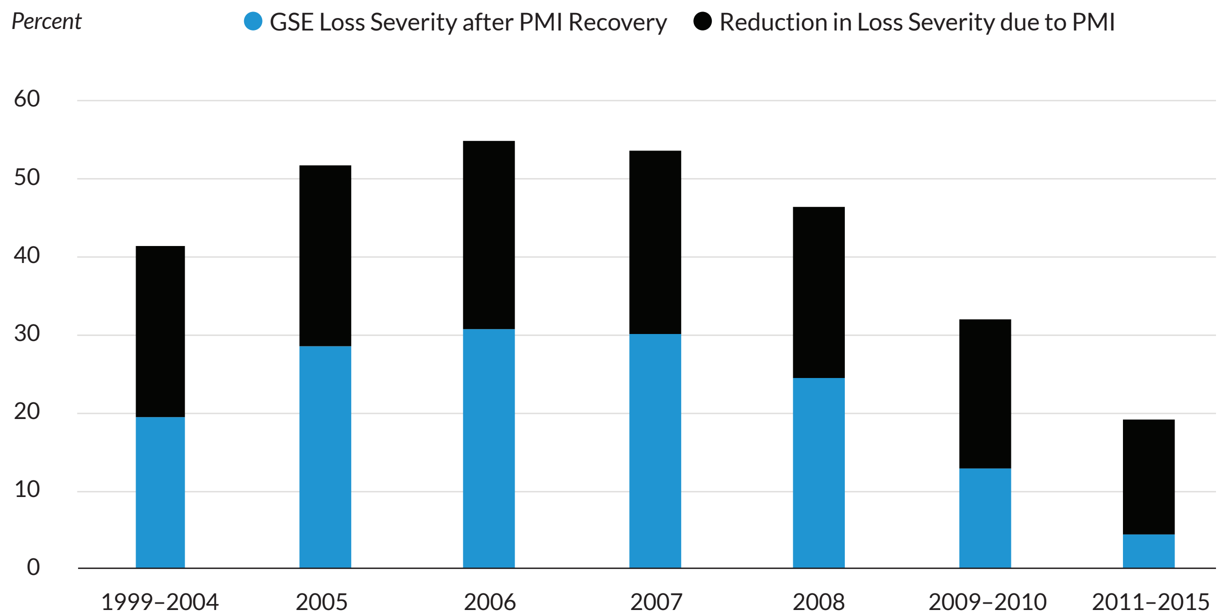
For the origination period from 1999 to 2015, the severity of loans without PMI was 49.5 percent, higher than the 32.6 percent severity for loans with PMI. The severity of mortgages with PMI was 55.3 percent before MI recovery. The mortgage insurance recovery share was 22.7 percent. The pattern in which the severity before the MI recovery is higher for PMI loans than for non-PMI loans, and the reduction in the actual loss severity to the GSEs holds across all origination year buckets.

Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Notes: GSE = government-sponsored enterprise; PMI = private mortgage insurance; REO = real estate owned. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans only. Adjustable-rate mortgages and Freddie Mac's Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

Total

Origination year	Total severity for PMI loans	MI recovery	Severity without MI recovery	Non-MI severity
1999–2004	20%	22%	42%	33%
2005	29%	23%	52%	42%
2006	31%	24%	55%	47%
2007	30%	24%	54%	47%
2008	25%	22%	46%	42%
2009–10	13%	19%	32%	29%
2011–15	5%	15%	19%	20%
All	25%	23%	48%	41%

Reduction in GSE Loss Severity due to PMI



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Foreclosure Alternative

Origination year	Total severity for PMI loans	MI recovery	Severity without MI recovery	Non-MI severity
1999–2004	14%	12%	27%	21%
2005	24%	21%	45%	37%
2006	25%	22%	47%	42%
2007	24%	23%	46%	41%
2008	19%	21%	39%	36%
2009–10	9%	18%	27%	23%
2011–15	3%	13%	16%	15%
All	20%	19%	39%	36%

REO or Foreclosure Alternatives

Origination year	Total severity for PMI loans	MI recovery	Severity without MI recovery	Non-MI severity
1999–2004	21%	25%	46%	39%
2005	31%	24%	55%	46%
2006	33%	25%	58%	51%
2007	34%	24%	58%	51%
2008	28%	22%	51%	46%
2009–10	16%	20%	36%	33%
2011–15	5%	15%	21%	23%
All	27%	24%	51%	46%

FHA versus PMI: Borrowing Cost

Monthly Payment Comparison

This page and the next compare monthly payments between FHA and GSE mortgages with PMI at different FICO and LTV levels. This analysis takes into account the FHA's up-front and annual mortgage insurance premiums, GSE loan-level payment adjustments, and up-to-date PMI pricing. For borrowers with a 96.5 percent LTV ratio (3.5 percent down), PMI is more economical than FHA only for borrowers with a FICO score of 760 or above. For borrowers with a 95 percent LTV ratio (5 percent down), PMI is more economical for FICO scores 740 and above.

Sources: Genworth Mortgage Insurance, Ginnie Mae, and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; LLPA = loan-level price adjustment; LTV = loan-to-value ratio; MIP = mortgage insurance premium; PMI = private mortgage insurance; UFMIP = Up Front Mortgage Insurance Premium. Mortgage insurance premiums are listed in percentage points. The PMI monthly payment calculation does not include special programs, such as Fannie Mae's HomeReady and Freddie Mac's Home Possible, both of which offer more favorable rates for low- and moderate-income borrowers.

FHA versus PMI: 96.5 LTV

FICO	620–639	640–659	660–679	680–699	700–719	720–739	740–759	760 +
FHA MI premiums								
FHA UFMIP	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
FHA MIP	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
PMI								
GSE LLPA*	3.50	2.75	2.25	1.50	1.50	1.00	0.75	0.75
PMI annual MIP	2.25	2.05	1.90	1.40	1.15	0.95	0.75	0.55
Monthly payment								
FHA	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353
PMI	$1,747	$1,685	$1,640	$1,518	$1,468	$1,413	$1,366	$1,326
PMI advantage	($394)	($332)	($287)	($165)	($115)	($60)	($13)	($27)

Assumptions

Property value $250,000 **Loan amount** $241,250 **LTV** 96.5% **Base rate-Conforming** 4.3% **Base rate-FHA** 4.07%

FHA versus PMI: 95 LTV

FICO	620–639	640–659	660–679	680–699	700–719	720–739	740–759	760 +
FHA MI premiums								
FHA UFMIP	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
FHA MIP	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PMI								
GSE LLPA*	3.25	2.75	2.25	1.25	1.00	0.50	0.25	0.25
PMI annual MIP	1.61	1.50	1.42	1.08	0.87	0.73	0.59	0.41
Monthly payment								
FHA	$1,322	$1,322	$1,322	$1,322	$1,322	$1,322	$1,322	$1,322
PMI	$1,586	$1,550	$1,520	$1,424	$1,376	$1,334	$1,299	$1,263
PMI advantage	($264)	($228)	($198)	($102)	($54)	($12)	$23	$59

Assumptions

Property value $250,000 **Loan amount** $237,500 **LTV** 95% **Base rate-Conforming** 4.3% **Base rate-FHA** 4.07%

Monthly Payment Comparison

For borrowers with a 90 percent LTV ratio (10 percent down), PMI is more economical for a wider range of borrowers (those with a FICO score 700 or above). For borrowers with an 85 percent LTV ratio, PMI is more economical for FICO scores as low as 680.

Sources: Genworth Mortgage Insurance, Ginnie Mae, and the Urban Institute.

Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; LLPA = loan-level price adjustment; LTV = loan-to-value ratio; MIP = mortgage insurance premium; PMI = private mortgage insurance; UFMIP = Up Front Mortgage Insurance Premium. Mortgage insurance premiums are listed in percentage points. The PMI monthly payment calculation does not include special programs, such as Fannie Mae's HomeReady and Freddie Mac's Home Possible, both of which offer more favorable rates for low- and moderate-income borrowers.

FHA versus PMI: 90 LTV

FICO	620–639	640–659	660–679	680–699	700–719	720–739	740–759	760 +
FHA MI premiums								
FHA UFMIP	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
FHA MIP	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PMI								
GSE LLPA*	3.25	2.75	2.25	1.25	1.00	0.50	0.25	0.25
PMI annual MIP	1.10	1.05	1.00	0.73	0.60	0.50	0.41	0.30
Monthly payment								
FHA	$1,252	$1,252	$1,252	$1,252	$1,252	$1,252	$1,252	$1,252
PMI	$1,407	$1,384	$1,361	$1,284	$1,253	$1,220	$1,197	$1,176
PMI advantage	($155)	($132)	($109)	($32)	($1)	$32	$55	$76

Assumptions

Property value $250,000 **Loan amount** $225,000 **LTV** 90% **Base rate-Conforming** 4.3% **Base rate-FHA** 4.07%

FHA versus PMI: 85 LTV

FICO	620–639	640–659	660–679	680–699	700–719	720–739	740–759	760 +
FHA MI premiums								
FHA UFMIP	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
FHA MIP	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PMI								
GSE LLPA*	3.25	3.25	2.75	1.50	1.00	0.50	0.25	0.25
PMI annual MIP	0.45	0.43	0.41	0.32	0.27	0.23	0.20	0.19
Monthly payment								
FHA	$1,183	$1,183	$1,183	$1,183	$1,183	$1,183	$1,183	$1,183
PMI	$1,214	$1,210	$1,194	$1,146	$1,125	$1,105	$1,093	$1,091
PMI advantage	($31)	($27)	($11)	$37	$58	$78	$90	$92

Assumptions

Property value $250,000 **Loan amount** $212,500 **LTV** 85% **Base rate-Conforming** 4.3% **Base rate-FHA** 4.07%

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