Global Markets Analysis Report

A MONTHLY PUBLICATION OF GINNIE MAE'S
OFFICE OF CAPITAL MARKETS

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Ginnie Mae
Our Guaranty Matters

PREPARED FOR GINNIE MAE
BY STATE STREET GLOBAL ADVISORS
URBAN INSTITUTE, HOUSING FINANCE POLICY CENTER

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HIGHLIGHTS

Introducing New Enhancements to the Global Markets Analysis Report

Starting this month, we are adding several enhancements to the Global Markets Analysis Report (GMA) in the form of new data and charts. Some of this is entirely new content designed to better align the GMA with latest market developments. Other enhancements provide a more detailed breakdown of data to offer better insights. In order to assist the reader get the most out of the new content, below is a list of new content and a brief explanation.

Relative Attractiveness, Ginnie II vs. Intermediate credit Index (Page 10): The new charts on this page compare the OAS on Ginnie Mae II securities to the US intermediate credit index, which has a similar duration as agency MBS. The top chart shows that since late 2015, yield on Ginnie Mae IIs has gradually increased, while the yield on the intermediate credit index has fallen, tightening the spread between the two. In the event of an economic downturn, we would expect the spread to widen again (i.e. Ginnie Mae securities to outperform) as investor concern about corporate credit risk moves front and center.

National House Price Increase by price tier (Page 13, bottom chart): This is also a new chart showing nationwide house price trends separately for the bottom, middle and top quintiles by price. Post-crisis house prices have risen the most at the lower end of the market, a segment where Ginnie Mae plays a major role. Fast appreciating house prices at the lower end of the market result in worsening affordability for low- and moderate-income households, although they also increase the equity cushion for existing home owners. Despite the slower rate of house price appreciation in 2019, prices for the bottom quintile rose by a hefty 6.5 percent during the 12-month period ended September 2019, much higher than the 3.9 percent for the top quintile over the same period.

Ginnie Mae, FHA and VA loan count by State (Pages 15 and 16): The table on page 15 now includes additional data on Ginnie Mae's loan count, both outstanding and flow, i.e. new issuances over the last 12 months by state. It shows Ginnie Mae's outstanding exposure by state, as well as the states that are driving new volume. As of October 2019, Ginnie Mae's portfolio had a total of 11.4 million loans, 1.8 million of which were originated in the prior 12 months.
The maps on page 16 provide visibility into FHA and VA's exposure to various states. California, Texas and Florida are the top three states for FHA and VA lending as measured by the number of loans outstanding. This is not surprising since the three are the most populous states. Virginia is the fourth largest state for VA lending in part due to a large population of veterans.

Breakdown of refinance volume by type and coupon (Page 23): Given increased investor and policy interest in prepayments, the bottom chart on page 23 details the breakdown of Ginnie Mae's refinance volume by type (i.e. streamlined, cash-out, and non-streamlined non-cash out) and coupon. It shows that YTD 2019, streamlined refinance loans have been more concentrated in lower coupons, while cash out refinances make up a larger share of higher coupons. Investors seeking to take on (or avoid) certain types refinance exposure may explore using coupon as a proxy.
The top chart on page 23 shows the refinance share of new monthly issuances by agency (FHA, VA and GSEs.) It shows that while VA's refinance share is higher than FHA's, it has been in line with that of the GSEs for several years. As interest rates dropped in 2019, refinance shares have increased across the three agencies.

HIGHLIGHTS

Cumulative default rate: FHA and VA (Page 32): The broad-based increase in DTI ratios over the last several years has led to concerns about the future performance of such “high-DTI” loans. Historically, default rates have been much more sensitive to FICOs than to DTIs. The two charts on this page show cumulative 180-day default rates for FHA and VA, by FICO and DTI. Both charts reveal the same insight: a large increase in DTI doesn’t result in a large increase in default rate when FICO is held constant. But a large decrease in FICO results in a large increase in defaults when DTI is held constant. The conclusion? DTI is a much weaker predictor of default than FICO.

The new data will be updated monthly going forward. We hope our readers find the enhancements useful.

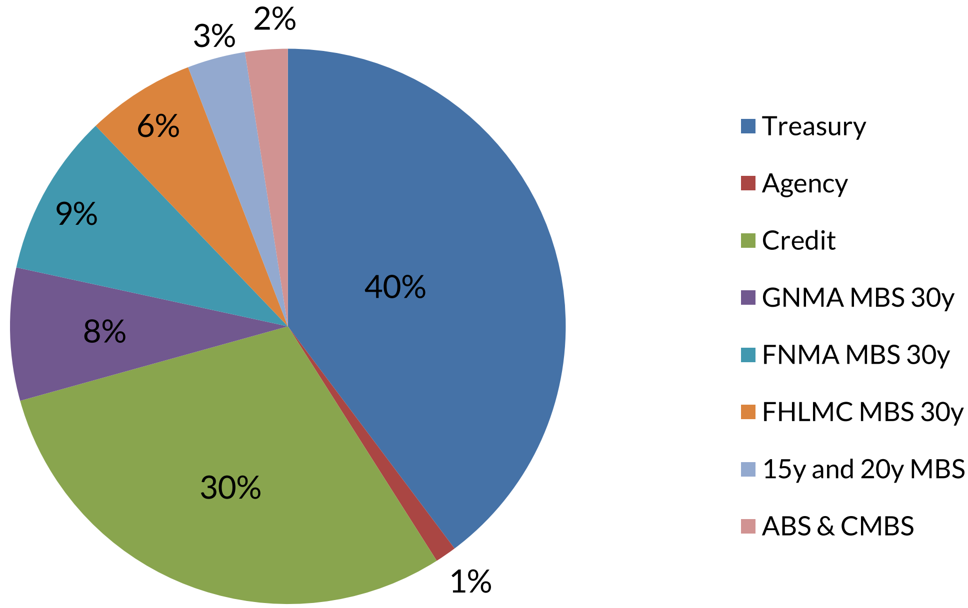
***Highlights this month*:**

- Despite slower appreciation in 2019, prices at the lower end of the housing market rose by 6.5 percent for 12 months ended September 2019, much higher than the 3.9 percent for the top end of the market (page 13).
- As of October 2019, California, Texas and Florida are the top 3 states for FHA and VA lending as measured by the number of loans outstanding, with California leading at 1.26 million FHA and 471,000 VA loans outstanding (page 16).
- The total value of the US housing market grew to $30.7 trillion in Q3 2019, according to the Federal Reserve’s Flow of Funds report; household equity accounted for $19.7 trillion of total value while mortgage debt made up the remaining $11.1 trillion (Page 17).
- DTIs are a much weaker predictor of default than credit score. In fact, for lower credit score FHA and VA borrowers, the default rate of loans with DTIs up to 45% is identical to the default rate for loans above 45% (page 32).
- In Q3 2019, MBS holdings at banks and thrifts increased to $2.0 trillion, with agency pass-throughs making up $1.5 trillion of holdings, $423 billion of which are Ginnie Mae (Page 55).

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

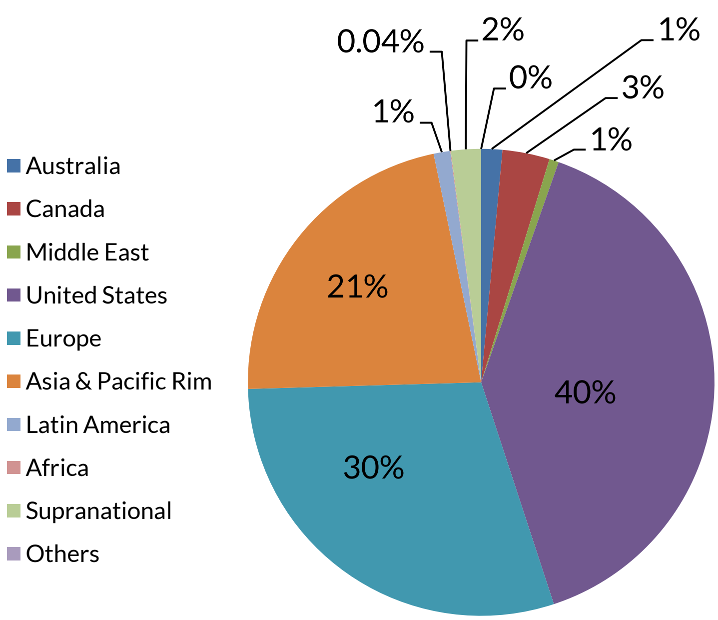
US MBS (Ginnie Mae, Fannie Mae, and Freddie Mac) comprise 27 percent of the Barclays US Aggregate Index- less than either the US Treasury share (40 percent) or the US Credit share (30 percent). Fannie Mae 30-year MBS comprises the largest percent of US MBS (9 percent), while Ginnie Mae 30-year MBS and Freddie Mac 30-year MBS comprise 8 percent and 6 percent of the market, respectively. Mortgages with terms of 15 and 20 years comprise the remaining balance (3 percent) of the US MBS share. US securities are the single largest contributor to the Barclays Global Aggregate, accounting for 40 percent of the global total. US MBS comprises 11 percent of the global aggregate.

Barclays US Aggregate Index



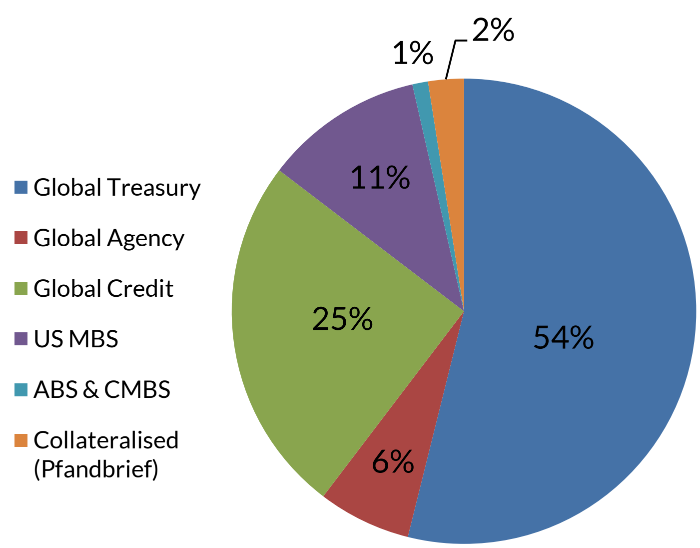
Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of September 2019.*
Note*: Numbers in chart may not add to 100 percent due to rounding.*

Barclays Global Aggregate Index by Country



Sources: *Bloomberg and State Street Global Advisors.*
Note: *Data as of September 2019.*

Barclays Global Aggregate Index by Sector

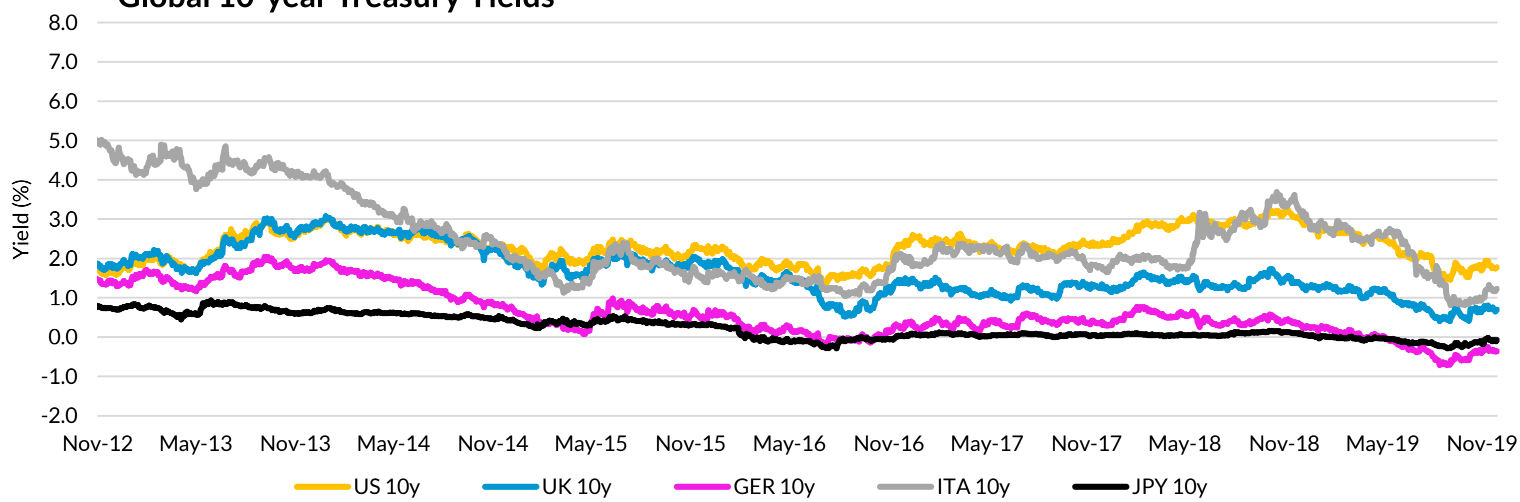


Sources: *Bloomberg and State Street Global Advisors*
Note*: Data as of September 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

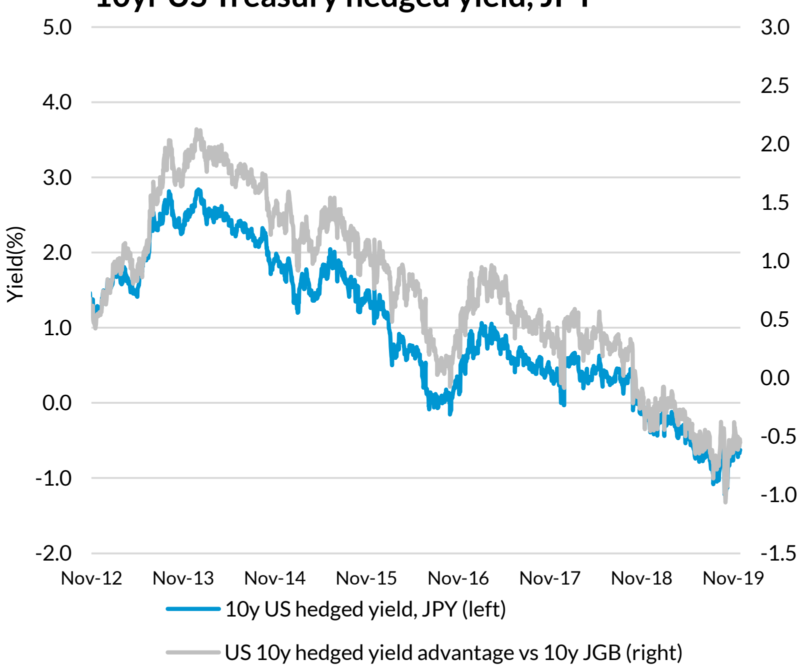
With weakness in recent economic data and worries about tariffs and trade wars, yields on government bonds have dropped across the globe over the course of 2019. The yield on the US 10-year treasury increased 8 bps in November to 1.78 percent, however, it is down 84 bps YTD. Despite being down on the year, US treasury yield remained the highest in the developed world. This is followed by yields on the Italian 10-year note, up 30 basis points in November to 1.23 percent, the UK 10-year bond, up 7 bps to 0.70 percent, German 10 year, up 5 bps to -0.36 percent, and the Japanese 10 year government bond, which rose by 6 basis points to -0.07 percent over the course of November. At the end of November, the hedged yield differential between the 10-year Treasury and the 10-year JGB stood at -55 bps, an increase of 8 bps since October. The hedged yield differential between the 10-year Treasury and the 10-year Bund stands at -38 bps, an increase of 7 bps since the end of October.

Global 10-year Treasury Yields



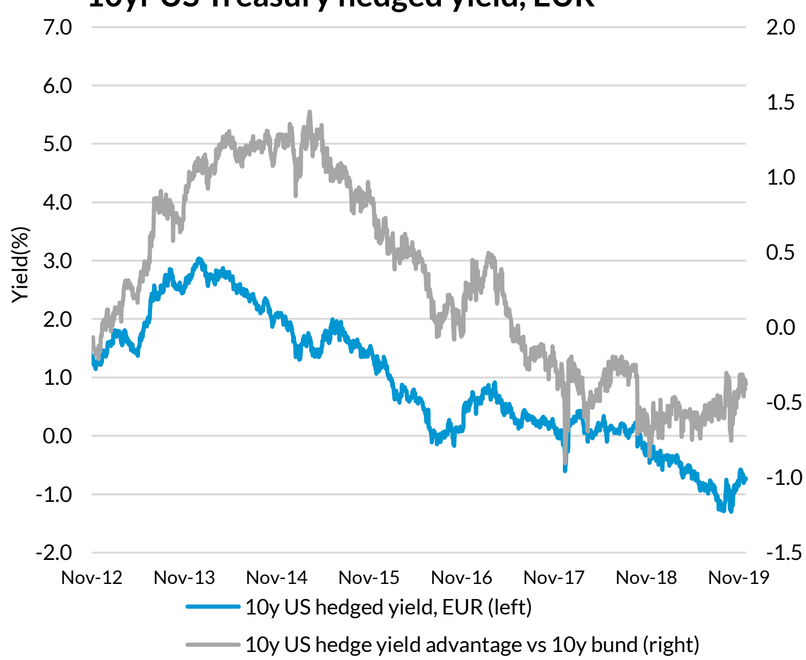
Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

10yr US Treasury hedged yield, JPY



Sources: *Bloomberg and State Street Global Advisors.*
Note: *Data as of November 2019.*

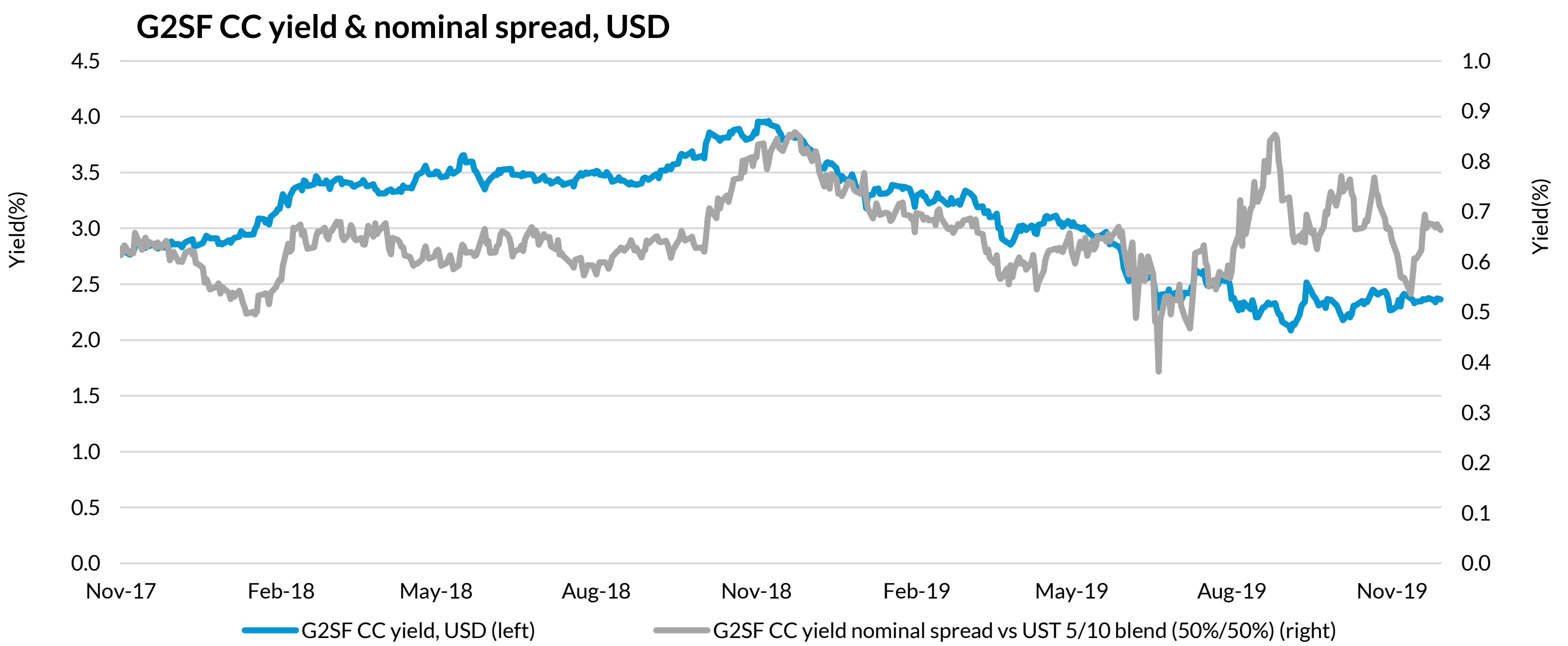
10yr US Treasury hedged yield, EUR



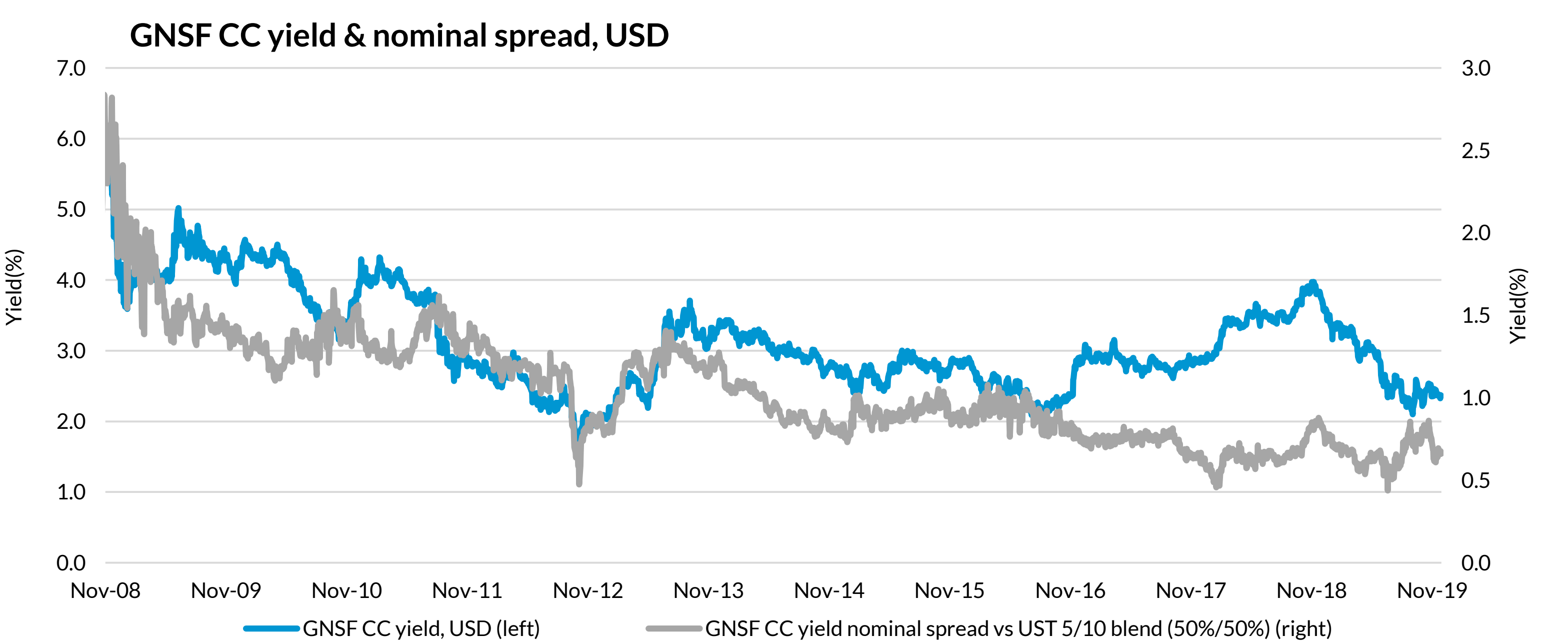
Sources: *Bloomberg and State Street Global Advisors*
Note*: Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

Nominal yields were largely unchanged in November 2019, with GNMA II yields marginally lower and GNMA I yields marginally higher. Current coupon Ginnie Mae securities outyield their Treasury counterparts (relative to the average of 5- and 10-year Treasury yields) by 66 bps on both the G2SF and GNSF, a tightening of 8 bps for GNSF and no change for G2SF since last month.



Sources: *Bloomberg and State Street Global Advisors.* ***Note****: Data as of November 2019.*

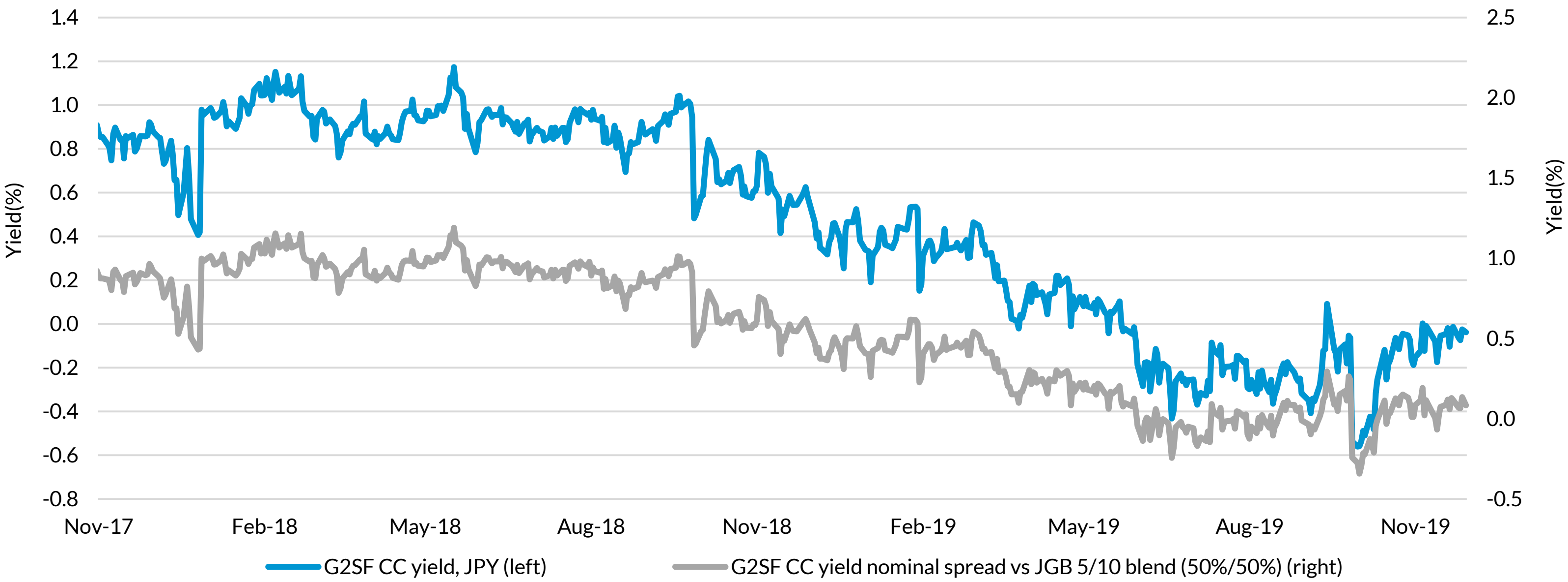


Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

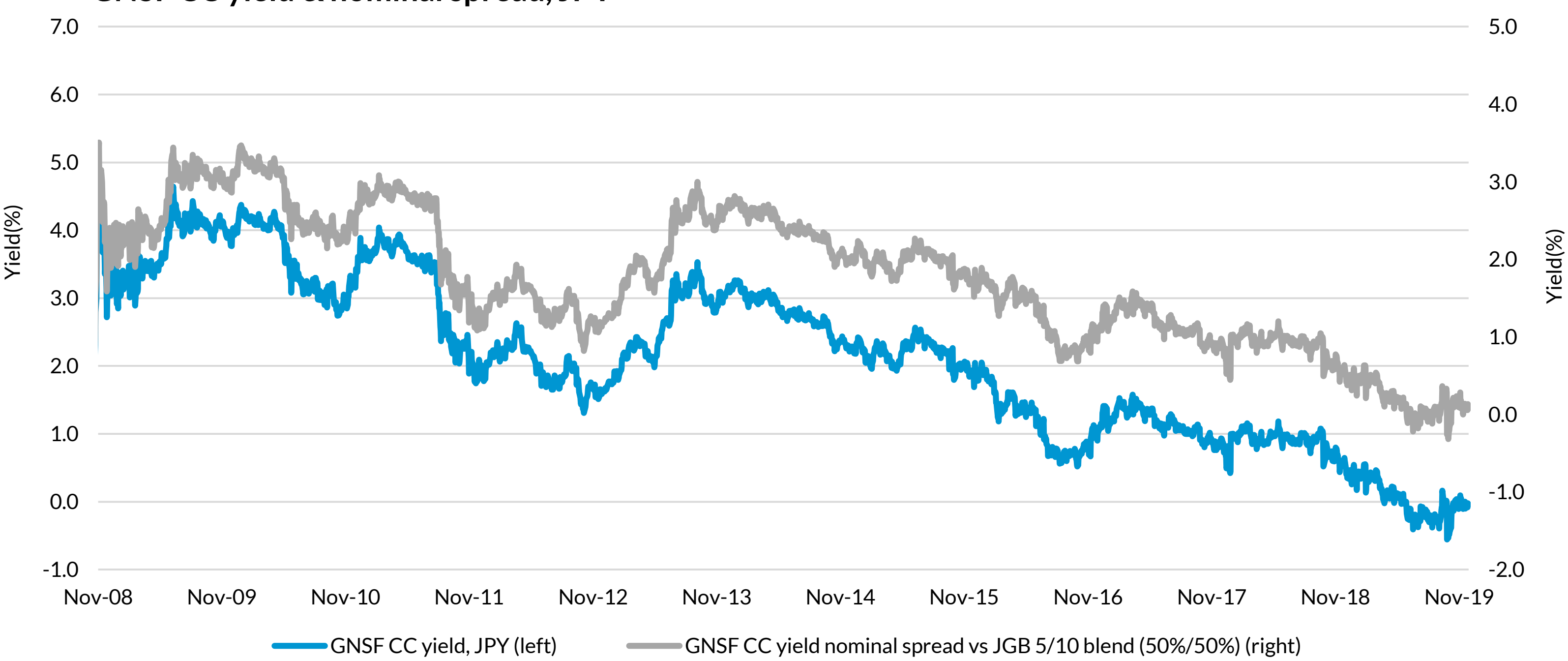
If Ginnie Mae securities are hedged into Japanese Yen, they look fair on a yield basis versus the JGB 5/10 blend. More precisely, both the G2SF and GNSF hedged into Japanese yen have a yield of 8 bps versus the JGB 5/10 blend. This represents a increase of 7 bps and a decrease of 1 bp. respectively, since the end of October.

G2SF CC yield & nominal spread, JPY



***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2019.*

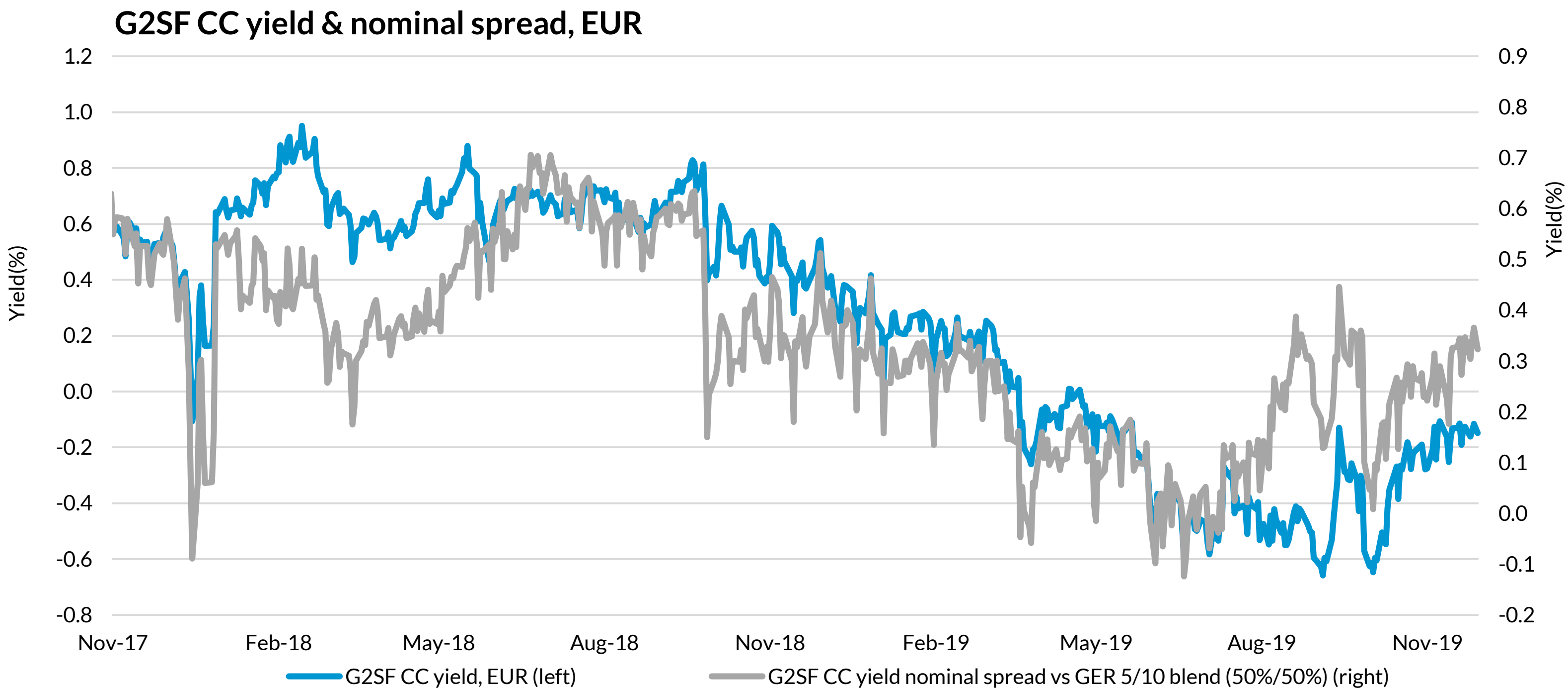
GNSF CC yield & nominal spread, JPY



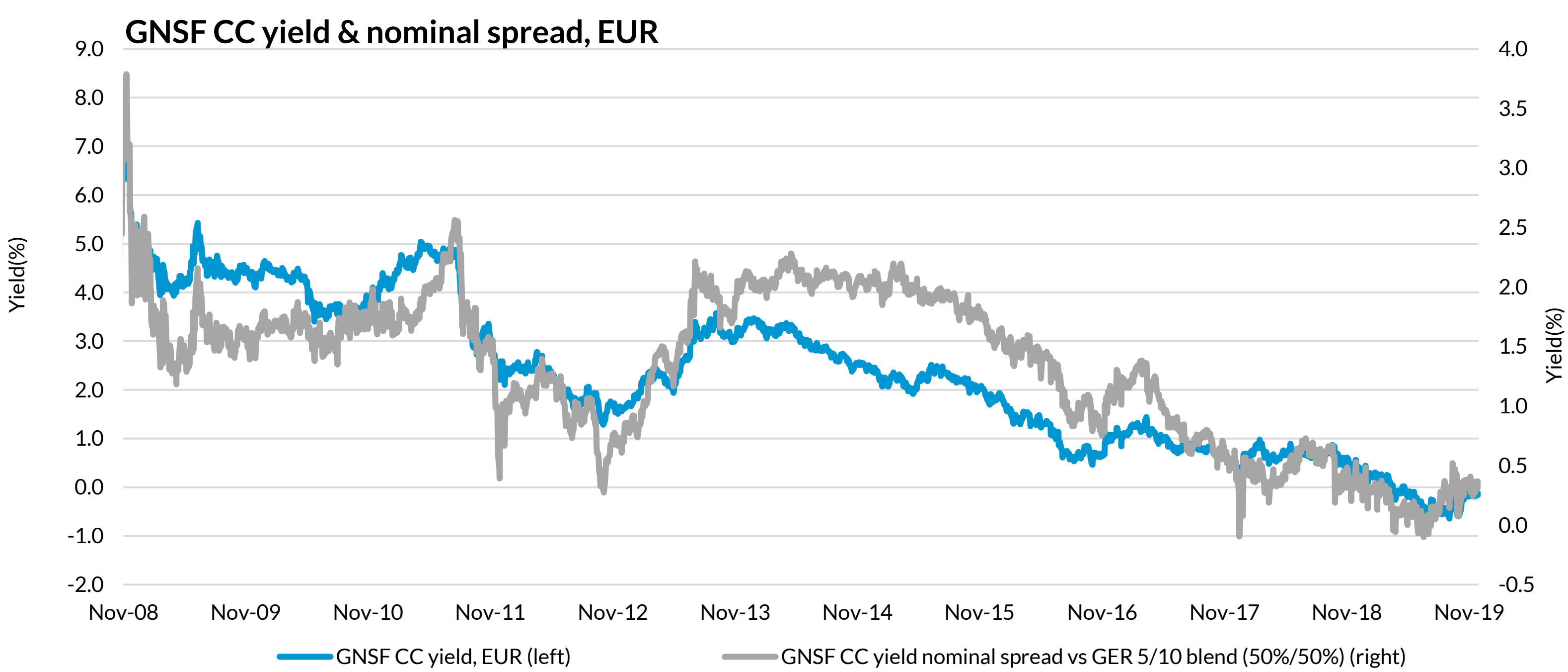
***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

If Ginnie Mae securities are hedged into Euros, they look favorable on a yield basis versus the German 5/10 Blend. The figures below show that at the end of November, the current coupon G2SF and GNSF hedged into euros have a 32 bp higher yield than the average of the German 5/10. This represents a 8 bp increase for the G2SF and no change for the GNSF since the end of October.



Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

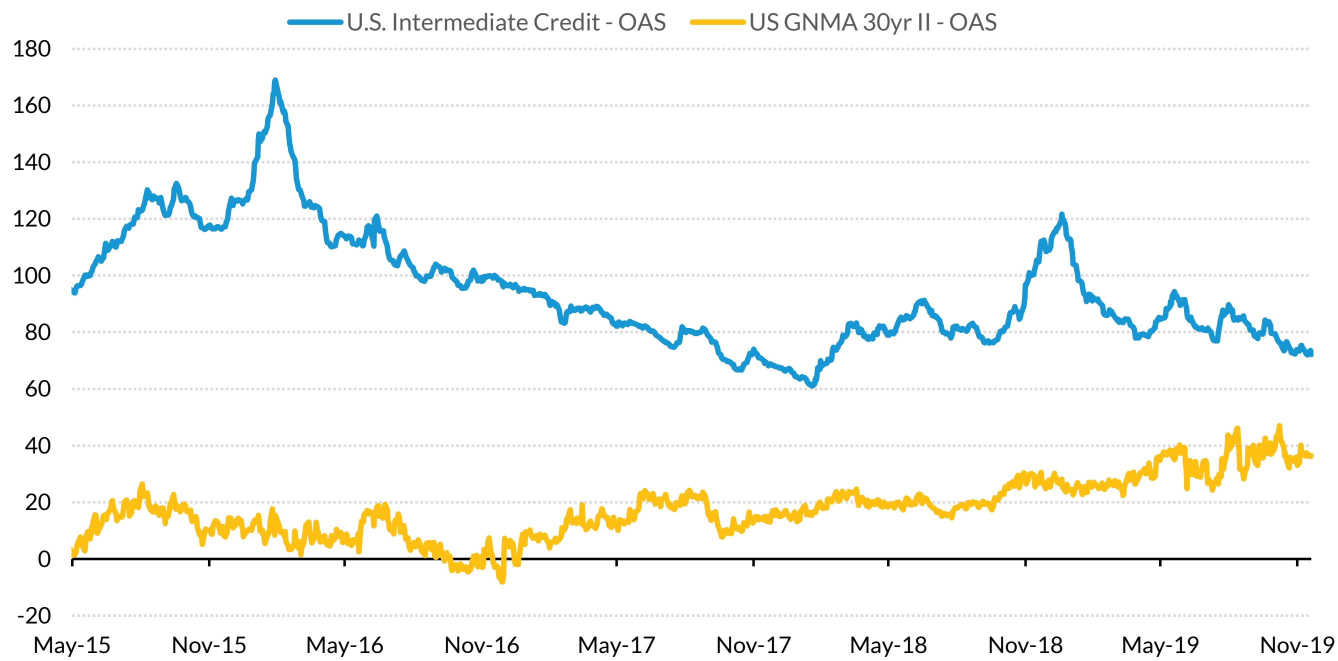


Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

After touching a peak of nearly 170 basis points in early 2016, the spread between US Intermediate Credit and GNMA II 30 year MBS has tightened steadily. Yield on intermediate credit has fallen while GNMA II yields are higher. While intermediate credit still has a higher option adjusted spread, by 36 bps at the end of November, this spread does not adjust for corporate credit risk. By contrast, Ginnie Mae's explicit US full faith and credit guaranty frees the MBS from credit risk. In the event of an economic downturn, we would expect the spread to widen (Ginnie Mae securities to outperform) as investor concern about corporate credit risk moves front and center.

G2 30 MBS versus Intermediate Credit



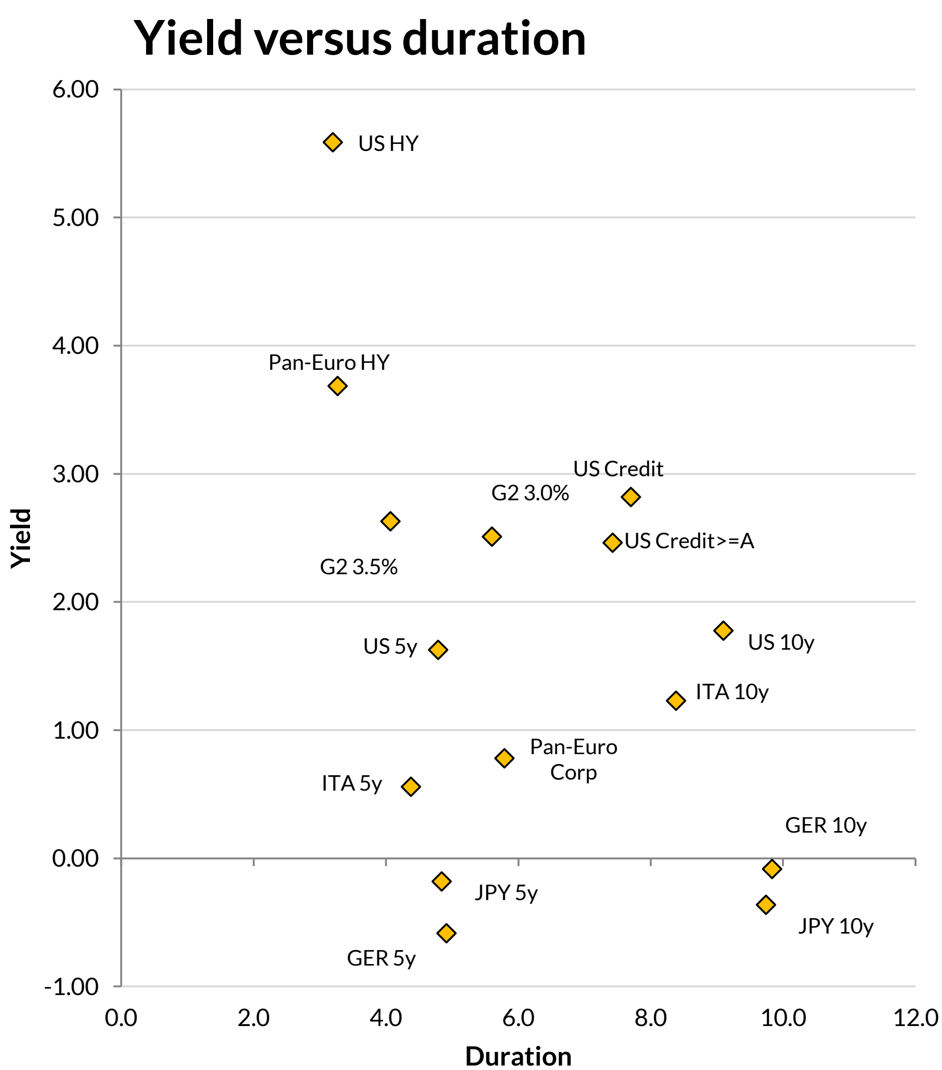
Sources: *State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

G2 30 MBS and Intermediate Credit OAS

Sources: *State Street Global Advisors.* ***Note:*** *Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

US MBS yields are about the same or higher than most securities with the same or longer durations. The only asset class with significantly more yield is the US high yield index. Duration, a measure of sensitivity to interest rate changes, does not fully capture the volatility of the high yield asset classes, as there is a large credit component.



Security	Duration	Yield
US 5y	4.8	1.63
US 10y	9.1	1.78
GNMA II 3.0%	5.6	2.51
GNMA II 3.5%	4.1	2.63
JPY 5y	4.8	-0.18
JPY 10y	9.8	-0.08
GER 5y	4.9	-0.59
GER 10y	9.7	-0.36
ITA 5y	4.4	0.56
ITA 10y	8.4	1.23
US credit	7.7	2.82
US credit >= A	7.4	2.46
US HY	3.2	5.59
Pan-Euro Corp	5.8	0.78
Pan-Euro HY	3.3	3.68

***Sources:** Bloomberg and State Street Global Advisors. **Note**: Yields are in base currency of security and unhedged. Data as of November 2019.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

The average return on the Ginnie Mae index over the past decade is equal to the US Treasury index. However, the standard deviation of the Ginnie Mae index is the lowest of any sector, as it has the least price volatility over a 1, 3, 5 and 10 year horizon. The result: The Sharpe Ratio, or excess return per unit of risk over the 10-year horizon is only marginally lower than most of the corporate indices, although a good bit higher than the US Treasury Index.

	Average Return (Per Month)					
Time Period	US MBS Ginnie Mae	US Treasury	US Credit Corp	Pan Euro Credit Corp	US High Yield*	Pan Euro High Yield*
1 year	0.62	0.79	1.24	0.66	0.79	0.82
3 year	0.24	0.29	0.50	0.25	0.52	0.41
5 year	0.19	0.21	0.38	0.23	0.45	0.38
10 year	0.25	0.24	0.45	0.40	0.63	0.68

	Average Excess Return (Per Month)					
Time Period	US MBS Ginnie Mae	US Treasury	US Credit Corp	Pan Euro Credit Corp	US High Yield*	Pan Euro High Yield*
1 year	0.44	0.62	1.07	0.71	0.61	0.88
3 year	0.10	0.16	0.36	0.31	0.38	0.47
5 year	0.11	0.13	0.29	0.28	0.37	0.44
10 year	0.21	0.20	0.40	0.42	0.59	0.70

	Standard Deviation					
Time Period	US MBS Ginnie Mae	US Treasury	US Credit Corp	Pan Euro Credit Corp	US High Yield*	Pan Euro High Yield*
1 year	0.62	1.34	1.16	0.72	1.67	1.19
3 year	0.61	0.99	1.06	0.69	1.18	1.05
5 year	0.57	1.06	1.17	0.98	1.53	1.34
10 year	0.67	1.05	1.18	1.14	1.69	1.69

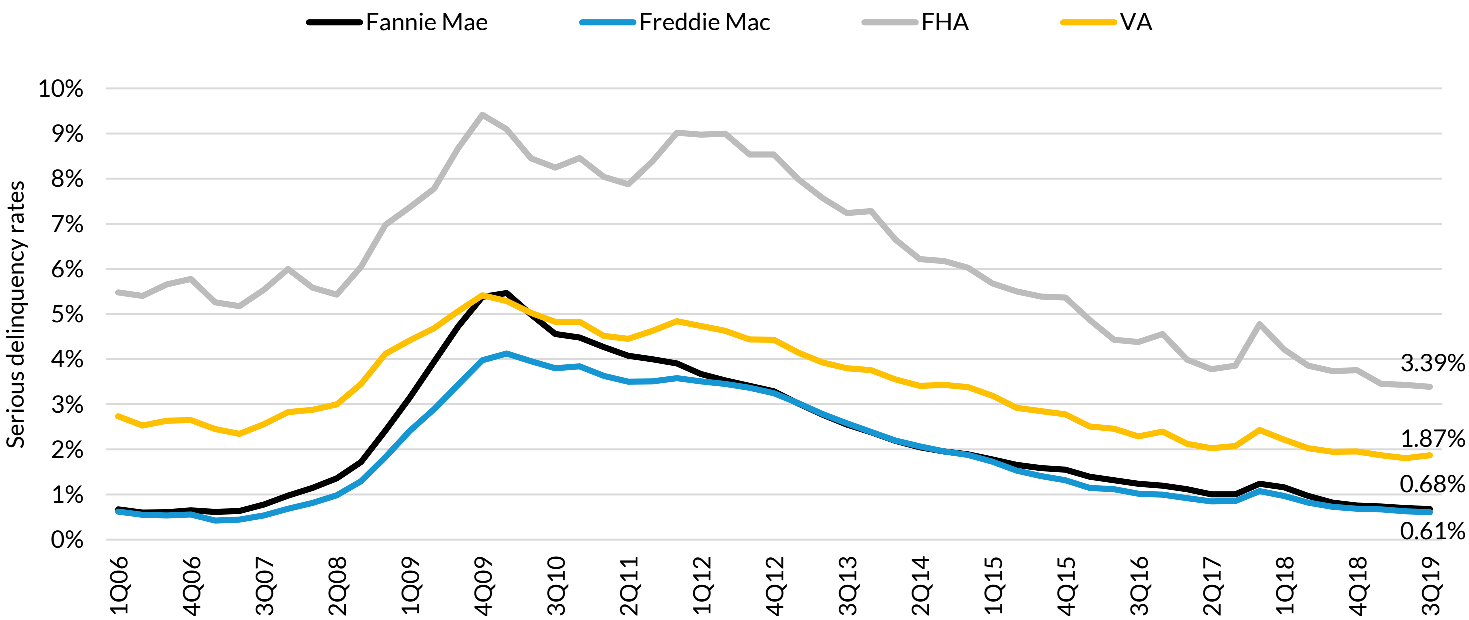
	Sharpe Ratio					
Time Period	US MBS Ginnie Mae	US Treasury	US Credit Corp	Pan Euro Credit Corp	US High Yield	Pan Euro High Yield*
1 year	0.72	0.46	0.92	0.99	0.37	0.74
3 year	0.17	0.16	0.34	0.45	0.33	0.45
5 year	0.19	0.12	0.25	0.29	0.24	0.32
10 year	0.31	0.19	0.34	0.37	0.35	0.41

**Assumes 2% capitalization max per issuer on high yield indices*
***Sources:** Barclays Indices, Bloomberg and State Street Global Advisors* ***Note:** Data as of November 2019.*

State of the US Housing Market

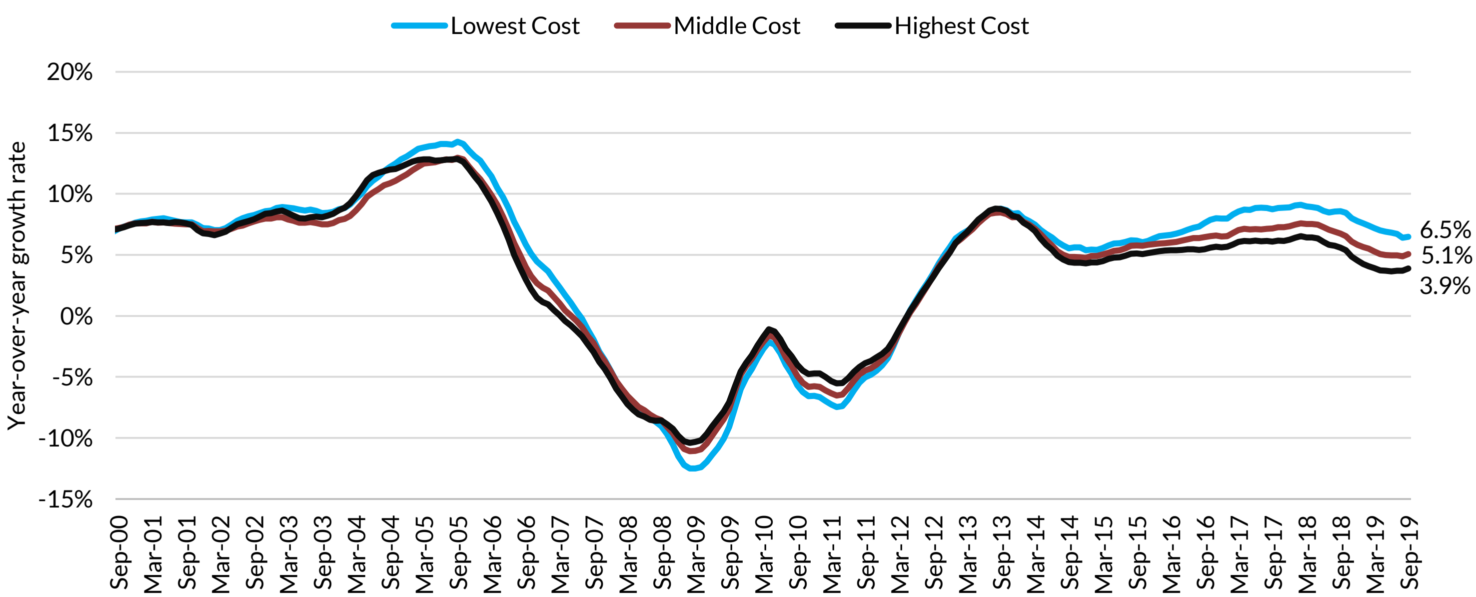
Serious delinquency rates for single-family GSE loans and FHA loans continued to decline in Q3 2019, while the rate grew slightly for VA loans. GSE delinquencies remain slightly higher relative to 2006-2007, while FHA and VA delinquencies (which are higher than their GSE counterparts) are well below 2006-2007 levels. The bottom chart shows nationwide house prices for the bottom, middle and the top quintiles by price. House prices have risen most at the lower end of the market where Ginnie Mae plays a major role. Despite the slower rate of appreciation in 2019, prices at the lower end of the market rose by 6.5 percent for 12 months ended September 2019, much higher than the 3.9 percent for the top end of the market.

Serious Delinquency Rates: Single-Family Loans



Sources: *Fannie Mae, Freddie Mac, MBA Delinquency Survey and Urban Institute.*
Note: *Serious delinquency is defined as 90 days or more past due or in the foreclosure process. Data as of Q3 2019.*

National Year-Over-Year HPI Growth



Sources: *Black Knight, Zillow, and Urban Institute.* ***Note:*** *Data as of September 2019.*

State of the US Housing Market

Nationally, nominal home prices have increased by 54.4 percent since the trough, and now exceed their pre-crisis peak valuation on a nominal basis by 15.1 percent. The picture is very different across states, with many states well in excess of the prior peak, while a few states remain 9 percent or more below peak levels: Connecticut (12.9% below), Maryland (9.1% below), Nevada (9.5% below), and Florida (9.0% below).

	HPI Changes				
State	**2000 to Peak**	**Peak to Trough**	**Trough to Current**	**YOY**	**Current HPI % Above Peak**
National	75.5%	-25.5%	54.4%	4.0%	15.1%
Alabama	43.9%	-15.0%	32.2%	6.3%	12.4%
Alaska	69.5%	-3.1%	24.7%	3.3%	20.8%
Arizona	110.1%	-47.9%	82.4%	5.7%	-5.1%
Arkansas	41.6%	-10.4%	25.7%	3.4%	12.6%
California	155.1%	-43.3%	89.7%	2.1%	7.5%
Colorado	40.3%	-12.8%	79.9%	4.4%	56.8%
Connecticut	92.3%	-24.6%	15.6%	2.2%	-12.9%
Delaware	95.1%	-23.9%	28.8%	2.4%	-2.0%
District of Columbia	175.4%	-13.6%	53.4%	1.2%	32.5%
Florida	128.9%	-47.0%	71.7%	3.8%	-9.0%
Georgia	38.2%	-31.9%	66.6%	5.4%	13.4%
Hawaii	161.7%	-22.3%	50.2%	1.6%	16.7%
Idaho	71.7%	-28.6%	86.5%	11.0%	33.3%
Illinois	61.6%	-34.5%	39.8%	2.1%	-8.5%
Indiana	21.1%	-7.8%	38.0%	6.6%	27.3%
Iowa	28.4%	-4.9%	29.1%	4.3%	22.7%
Kansas	34.7%	-9.2%	42.7%	5.7%	29.6%
Kentucky	29.5%	-7.8%	31.3%	4.1%	21.1%
Louisiana	48.8%	-5.1%	23.4%	2.7%	17.2%
Maine	82.1%	-12.5%	38.3%	5.2%	21.1%
Maryland	129.3%	-28.6%	27.3%	1.7%	-9.1%
Massachusetts	92.5%	-22.8%	55.8%	3.7%	20.2%
Michigan	24.0%	-39.5%	78.1%	4.6%	7.6%
Minnesota	66.5%	-27.7%	56.9%	4.8%	13.4%
Mississippi	41.1%	-13.7%	27.0%	2.8%	9.6%
Missouri	42.8%	-14.9%	37.1%	7.3%	16.7%
Montana	81.9%	-11.1%	51.3%	6.1%	34.4%
Nebraska	26.6%	-6.6%	42.6%	4.5%	33.1%
Nevada	127.0%	-59.2%	121.9%	2.7%	-9.5%
New Hampshire	90.6%	-23.5%	43.0%	5.4%	9.3%
New Jersey	117.8%	-27.9%	28.1%	2.7%	-7.6%
New Mexico	67.1%	-16.2%	23.8%	5.1%	3.7%
New York	98.5%	-15.1%	42.4%	3.7%	20.9%
North Carolina	40.7%	-15.7%	37.0%	4.9%	15.5%
North Dakota	54.0%	-3.8%	56.4%	2.5%	50.5%
Ohio	21.2%	-18.4%	38.3%	5.5%	12.8%
Oklahoma	37.4%	-2.4%	19.8%	3.8%	17.0%
Oregon	82.4%	-28.0%	79.6%	4.4%	29.3%
Pennsylvania	70.2%	-11.6%	25.6%	3.7%	11.0%
Rhode Island	131.0%	-34.5%	53.5%	5.8%	0.5%
South Carolina	44.7%	-19.2%	35.8%	4.4%	9.7%
South Dakota	45.0%	-3.9%	47.7%	4.9%	41.9%
Tennessee	35.2%	-11.8%	46.4%	6.6%	29.1%
Texas	33.3%	-5.7%	51.5%	3.4%	42.8%
Utah	54.7%	-21.9%	75.6%	6.9%	37.1%
Vermont	83.5%	-7.5%	34.8%	6.5%	24.7%
Virginia	99.4%	-22.7%	27.9%	4.3%	-1.2%
Washington	85.4%	-28.7%	87.0%	4.9%	33.4%
West Virginia	42.9%	-6.5%	24.9%	3.6%	16.9%
Wisconsin	44.7%	-16.3%	37.9%	5.2%	15.5%
Wyoming	77.4%	-5.7%	30.3%	5.5%	22.8%

Sources: *Black Knight and Urban Institute.* ***Note:*** *HPI data as of September 2019. Negative sign indicates that state is above earlier peak. Peak refers to the month when HPI reached the highest level for each state/US during the housing boom period, ranging from 09/2005 to 09/2008. Trough represents the month when HPI fell to the lowest level for each state/US after the housing bust, ranging from 01/2009 to 03/2012. Current is 09/2019, the latest HPI data period.*

State of the US Housing Market

Ginnie Mae MBS constitute 29.2 percent of outstanding agency issuance by loan balance and 32.7 percent of new issuance over the past year. However, the Ginnie Mae share varies widely across states, with the share of outstanding (by loan balance) as low as 14.9 percent in the District of Columbia and as high as 50.1 percent in Alaska. In general, the Ginnie Mae share is higher in states with lower home prices.

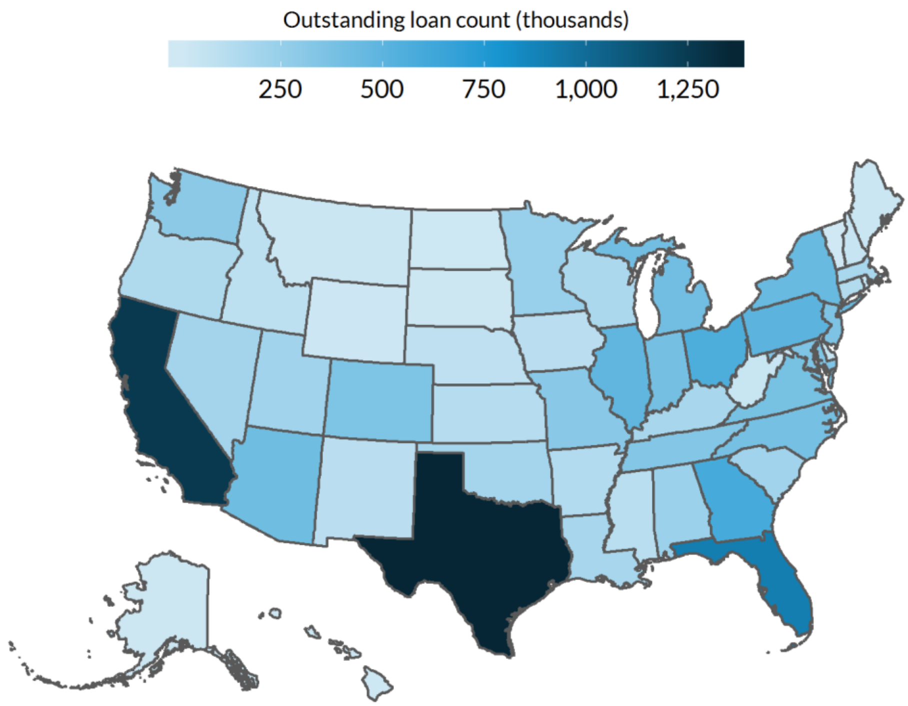
State	Agency Issuance (past 1 year)				Agency Outstanding			
	GNMA Share	GNMA Loan Count	GNMA Avg. Loan Size (000)	GSE Avg. Loan Size (000)	GNMA Share	GNMA Loan Count	GNMA Avg. Loan Size (000)	GSE Avg. Loan Size (000)
National	32.7%	1,854,155	230.5	247.3	29.2%	11,416,262	163.6	189.4
Alabama	44.1%	34,554	174.6	195.8	43.6%	237,072	128.1	152.6
Alaska	51.4%	5,007	292.0	260.9	50.1%	38,685	231.6	199.8
Arizona	32.4%	63,494	230.7	234.1	29.3%	321,774	164.8	180.2
Arkansas	42.7%	19,195	151.0	176.9	43.2%	139,334	110.5	138.2
California	27.5%	156,483	370.6	358.3	19.5%	794,083	265.6	269.1
Colorado	32.2%	53,979	312.4	300.9	25.1%	240,287	218.4	227.8
Connecticut	31.3%	15,385	222.6	237.9	28.6%	109,476	182.2	189.0
Delaware	37.9%	7,965	224.7	236.5	35.3%	51,785	179.5	184.5
District of Columbia	17.8%	1,409	443.2	389.8	14.9%	10,164	299.7	305.0
Florida	40.0%	167,237	223.0	219.9	34.1%	833,048	165.9	172.4
Georgia	40.1%	85,857	198.5	223.5	37.2%	517,954	143.1	171.2
Hawaii	42.4%	6,157	517.1	413.5	28.9%	31,530	383.9	316.9
Idaho	32.8%	14,867	227.5	225.5	29.8%	80,421	154.7	169.7
Illinois	24.9%	54,916	186.0	212.2	23.7%	374,979	140.5	160.9
Indiana	36.1%	47,597	153.8	170.7	36.1%	309,861	110.9	127.2
Iowa	25.9%	12,557	154.7	175.2	24.7%	87,711	113.6	131.7
Kansas	35.0%	14,976	164.6	188.3	34.2%	106,790	119.6	139.6
Kentucky	38.6%	26,286	159.6	178.8	37.6%	169,014	121.1	133.5
Louisiana	43.0%	28,091	178.1	201.7	40.9%	187,797	136.8	159.3
Maine	33.9%	6,640	195.7	214.4	31.1%	40,945	152.1	161.6
Maryland	43.2%	47,142	296.7	283.6	37.9%	305,266	230.8	219.7
Massachusetts	22.9%	22,504	311.3	307.9	18.3%	125,058	236.1	230.2
Michigan	24.0%	46,083	158.2	183.6	24.1%	312,330	113.3	135.8
Minnesota	23.5%	27,142	213.3	227.1	22.6%	193,550	155.9	172.0
Mississippi	50.9%	16,965	162.1	180.9	49.3%	115,338	120.1	142.4
Missouri	34.0%	40,477	163.1	186.2	33.6%	267,373	120.4	139.7
Montana	29.7%	5,699	231.5	235.3	28.0%	37,089	169.4	178.6
Nebraska	32.4%	10,154	177.6	182.7	31.6%	74,716	122.1	138.4
Nevada	37.1%	29,673	270.5	251.2	32.7%	144,329	187.7	193.9
New Hampshire	31.3%	7,747	250.9	240.1	27.7%	45,439	192.7	182.6
New Jersey	28.7%	39,449	265.7	283.8	26.1%	250,292	209.9	220.0
New Mexico	41.8%	13,366	191.2	200.8	41.4%	98,590	140.7	153.6
New York	23.8%	41,672	257.6	290.6	24.4%	338,607	186.8	216.4
North Carolina	34.8%	67,676	195.6	220.2	32.5%	432,488	141.0	167.3
North Dakota	29.3%	2,533	222.0	218.5	25.2%	16,900	167.1	167.3
Ohio	33.2%	63,466	152.9	168.1	34.5%	456,777	112.2	127.4
Oklahoma	44.9%	25,748	162.3	182.2	46.6%	197,039	119.0	140.9
Oregon	28.3%	24,327	278.8	276.5	22.1%	128,683	198.9	209.3
Pennsylvania	31.4%	56,282	175.4	206.4	31.4%	419,894	136.0	159.1
Rhode Island	37.8%	6,404	245.6	237.0	32.6%	37,119	187.9	183.6
South Carolina	39.9%	40,336	198.0	207.9	36.1%	227,532	147.0	161.8
South Dakota	36.9%	5,152	187.8	197.4	34.5%	31,086	142.9	150.5
Tennessee	39.5%	49,178	199.1	216.3	37.9%	299,590	138.7	166.0
Texas	34.3%	159,984	211.3	228.1	34.3%	1,085,597	142.9	176.5
Utah	26.8%	25,594	268.5	275.6	25.4%	130,410	190.8	210.9
Vermont	24.1%	1,993	197.7	211.8	19.6%	12,850	164.1	159.8
Virginia	43.7%	68,778	286.5	282.4	39.4%	452,581	220.1	218.1
Washington	31.4%	52,262	314.1	312.5	25.6%	275,459	218.4	231.9
West Virginia	49.2%	8,443	162.5	164.9	45.1%	54,600	126.0	127.5
Wisconsin	21.4%	20,889	180.3	191.3	19.7%	139,794	133.2	142.2
Wyoming	41.3%	4,385	226.2	228.0	38.6%	27,176	177.3	177.4

***Sources:** eMBS and Urban Institute. **Note:** Ginnie Mae outstanding share are based on loan balance as of October 2019. Ginnie Mae issuance is based on the last 12 months, from October 2018 to October 2019.*

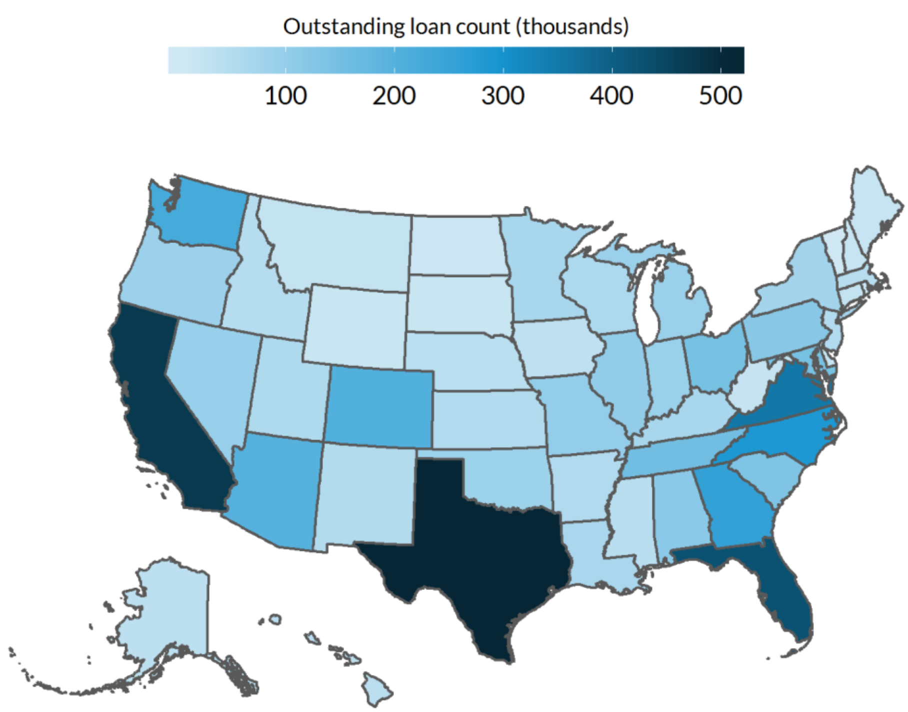
FHA and VA Outstanding Loan Count

California, Texas and Florida are the top 3 states for FHA and VA lending as measured by the number of loans outstanding. As of October 2019, CA had 1.26 million FHA and 471,000 VA loans outstanding, TX has 1.35 million and 508,000, and FL had 900,000 FHA and 427,000 VA loans outstanding. Virginia ranks 4th for number of VA loans outstanding and 13th for number of FHA loans outstanding.

FHA Outstanding Loan Count by State



VA Outstanding Loan Count by State

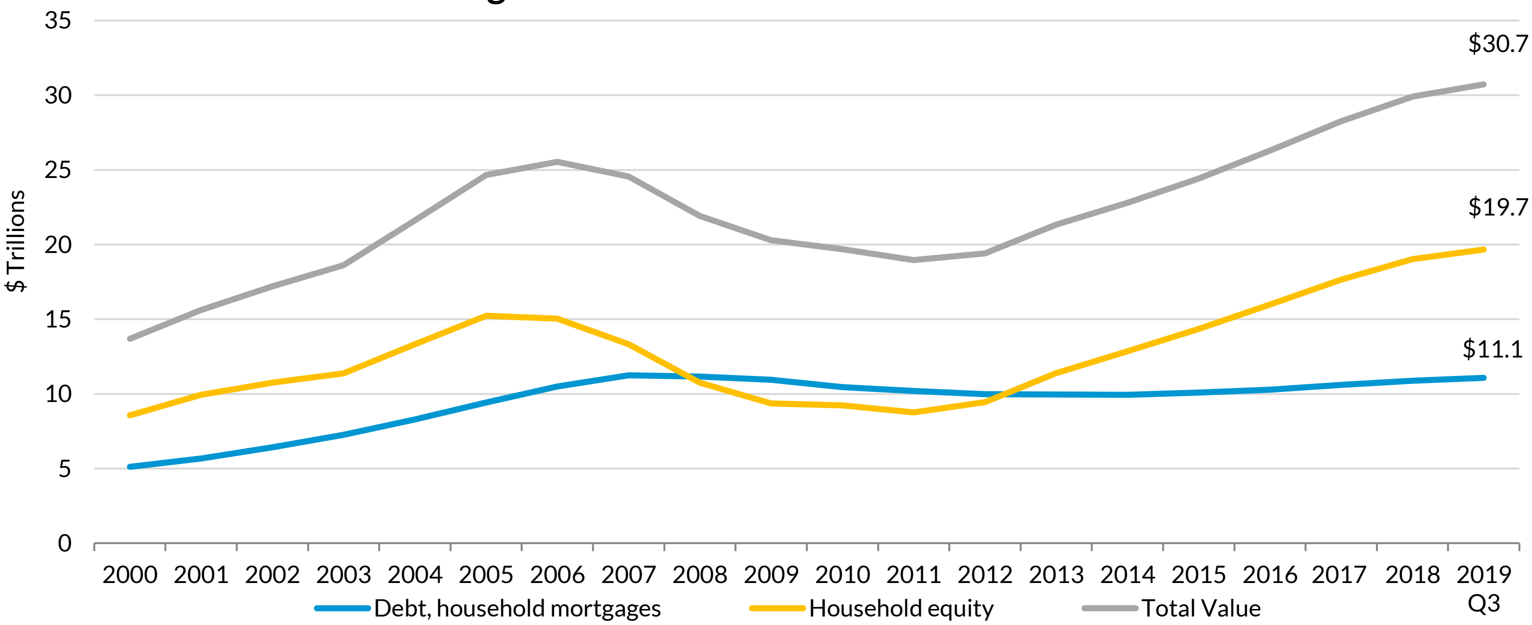


Sources: *eMBS and Urban Institute.* ***Note:*** *Ginnie Mae outstanding share are based on loan balance as of October 2019.*

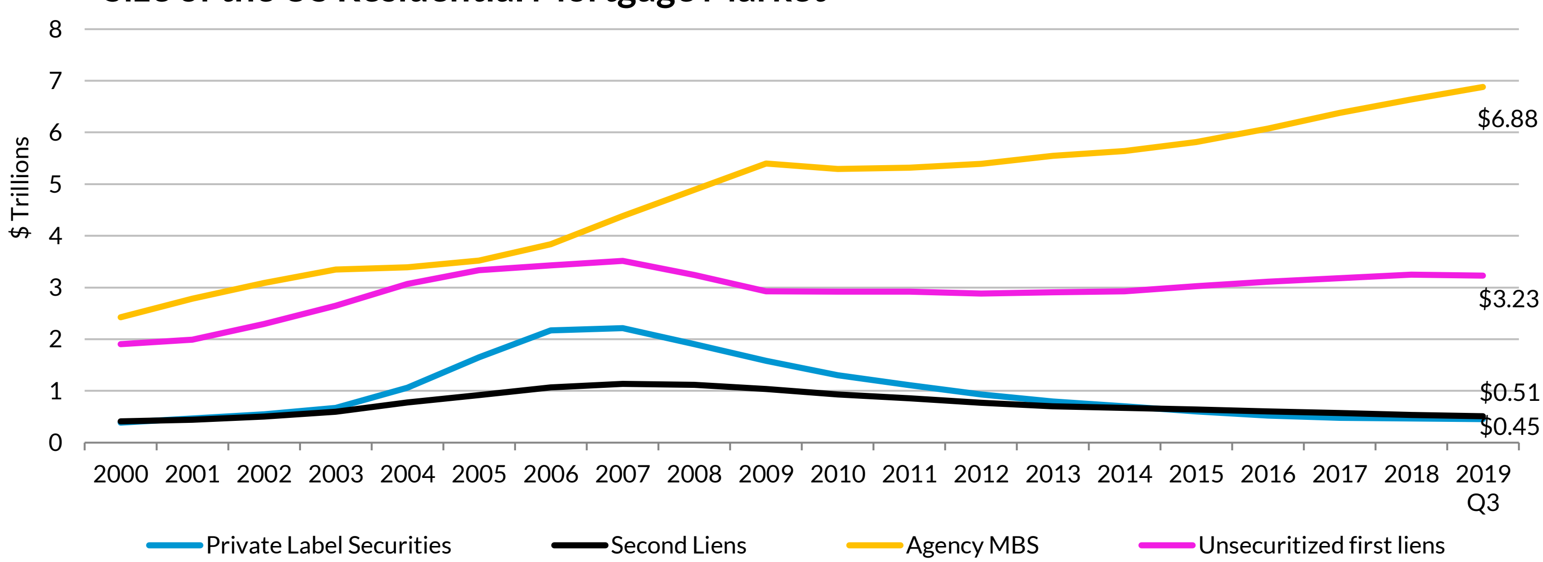
State of the US Housing Market

The Federal Reserve's Flow of Funds report has indicated a gradually increasing total value of the housing market driven by growing household equity since 2012, and Q3 2019 was no different. Total mortgage debt outstanding and household equity were up slightly from Q2 2019 to $11.1 and $19.7 trillion in Q3 2019, bringing the total value of the housing market to $30.7 trillion. The market is now 20.3 percent higher than the pre-crisis peak in 2006. Agency MBS account for 62.21 percent of the total mortgage debt outstanding, private-label securities make up 4.1 percent, and unsecuritized first liens make up 29.2 percent. Second liens comprise the remaining 4.6 percent of the total.

Value of the US Housing Market



Size of the US Residential Mortgage Market

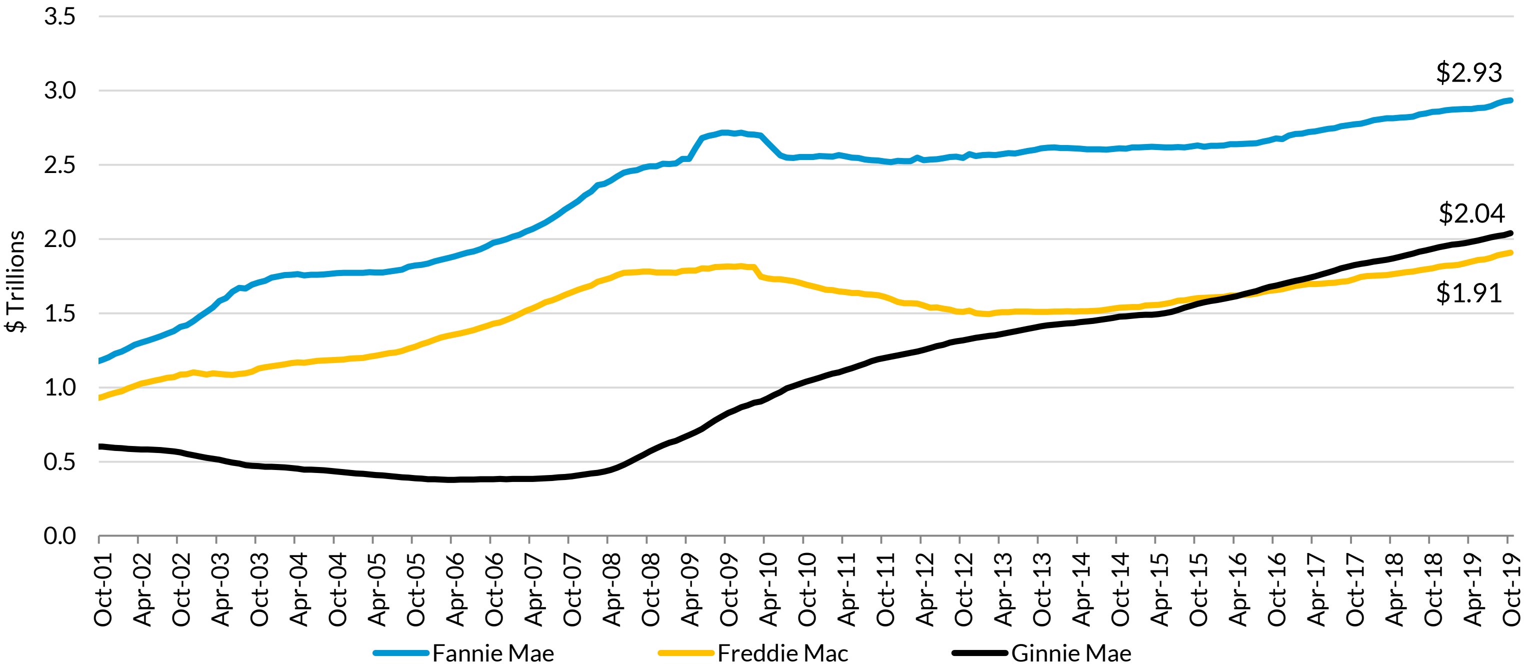


Sources: *Federal Reserve Flow of Funds, Inside Mortgage Finance, eMBS and Urban Institute.*
Note: *Unsecuritized first liens includes loans held by commercial banks, GSEs, savings institutions, and credit unions.*

State of the US Housing Market

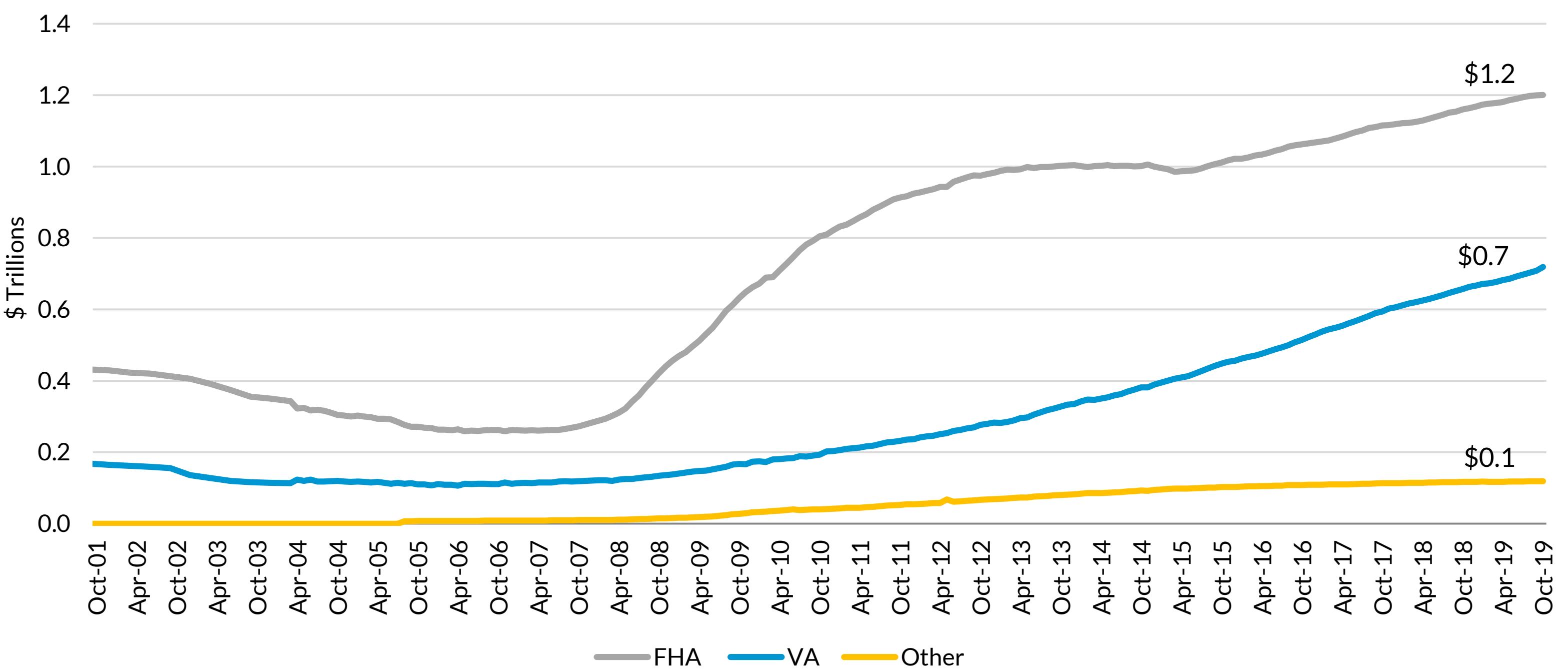
As of October 2019, outstanding securities in the agency market totaled $6.88 trillion: 42.7 percent Fannie Mae, 27.7 percent Freddie Mac, and 29.6 percent Ginnie Mae MBS. Ginnie Mae has more outstandings than Freddie Mac. Within the Ginnie Mae market, both FHA and VA have grown very rapidly post-crisis. FHA comprises 58.9 percent of total Ginnie Mae MBS outstanding, while VA comprises 35.3 percent.

Outstanding Agency Mortgage-Backed Securities



Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2019.*

Outstanding Ginnie Mae Mortgage-Backed Securities

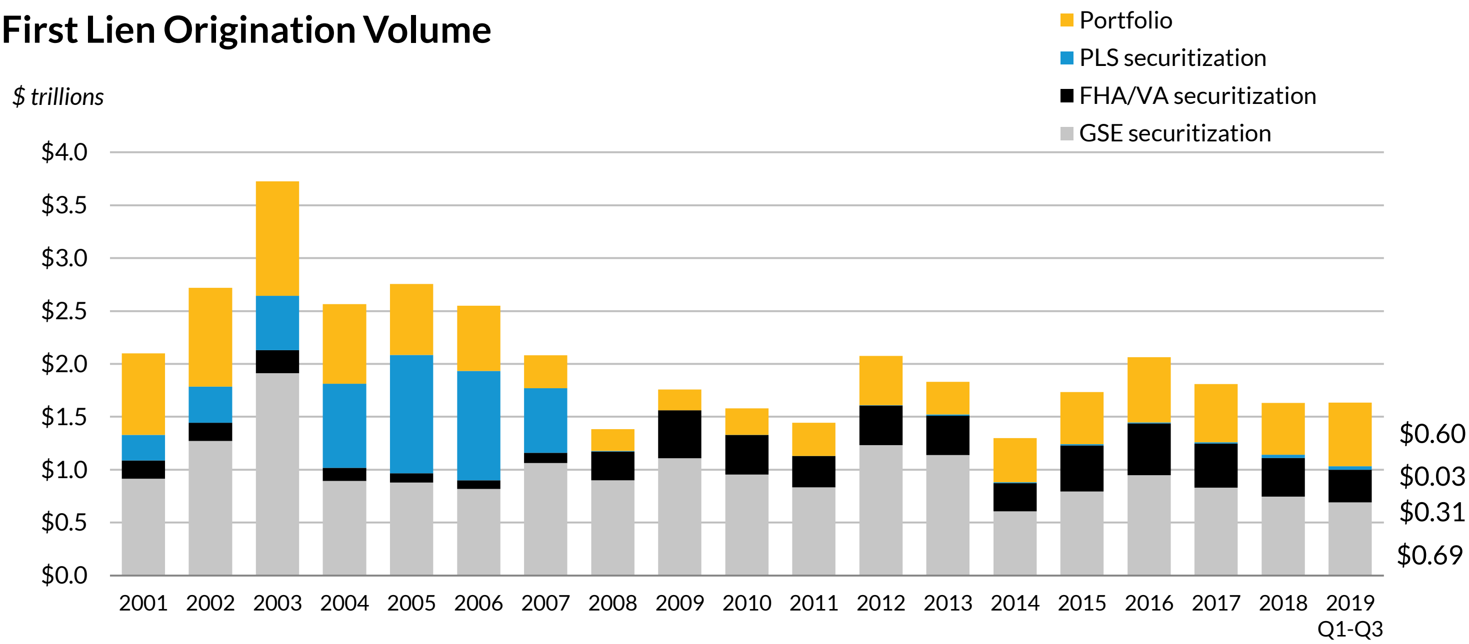


Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2019.*

State of the US Housing Market

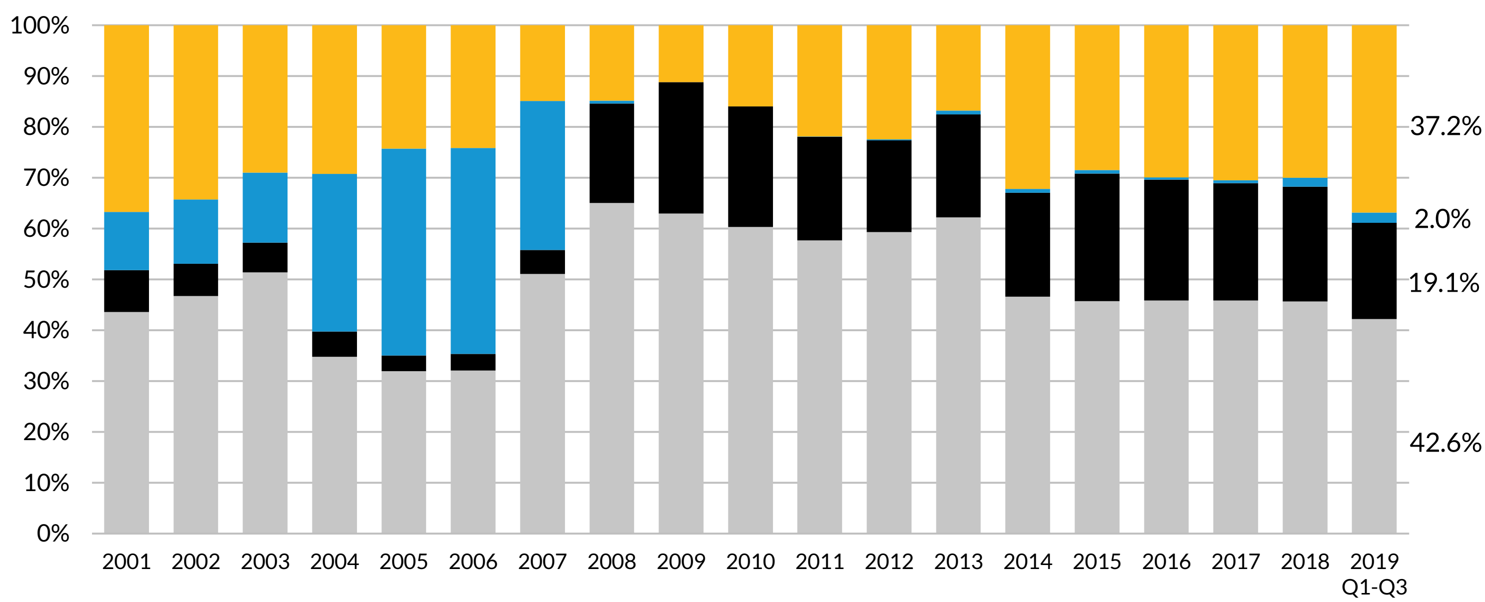
In the first three quarters of 2019, first lien originations totaled $1.62 trillion, up from $1.26 trillion at the same point in 2018. The share of portfolio originations was 37.2 percent through Q3 2019, up significantly from 30.9 percent in the same period of 2018. The GSE share was down at 42.6 percent, compared to 45.1 percent in the first three quarters of 2018. The FHA/VA share fell slightly, at 19.1 percent compared to 22.1 percent in the same period last year. Private-label securitization at 2.0 percent maintained the same share as one year ago, but remains a fraction of its share in the pre-bubble years.

First Lien Origination Volume



Sources: *Inside Mortgage Finance and Urban Institute.* **Note:** *Data as of Q3 2019.*

First Lien Origination Share



Sources: *Inside Mortgage Finance and Urban Institute.* **Note:** *Data as of Q3 2019.*

US Agency Market, Originations

Agency gross issuance was $1.21 trillion in the first ten months of 2019, up 20.0 percent compared to the same period in 2018. Ginnie Mae gross issuance was up by 18.2 percent and GSE gross issuance was up by 20.9 percent. Within the Ginnie Mae market, FHA was up by 13.3 percent and VA origination was up by 28.2 percent. While origination volumes were lower in January and February, a favorable rate environment has led to an increase in issuance year-over-year.

Agency Gross Issuance					
Issuance Year	Fannie Mae	Freddie Mac	GSE Total	Ginnie Mae	Total
2000	$202.8	$157.9	$360.6	$102.2	$462.8
2001	$506.9	$378.2	$885.1	$171.5	$1,056.6
2002	$710.0	$529.0	$1,238.9	$169.0	$1,407.9
2003	$1,174.4	$700.5	$1,874.9	$213.1	$2,088.0
2004	$517.5	$355.2	$872.6	$119.2	$991.9
2005	$514.1	$379.9	$894.0	$81.4	$975.3
2006	$500.2	$352.9	$853.0	$76.7	$929.7
2007	$633.0	$433.3	$1,066.2	$94.9	$1,161.1
2008	$562.7	$348.7	$911.4	$267.6	$1,179.0
2009	$817.1	$462.9	$1,280.0	$451.3	$1,731.3
2010	$626.6	$377.0	$1,003.5	$390.7	$1,394.3
2011	$578.2	$301.2	$879.3	$315.3	$1,194.7
2012	$847.6	$441.3	$1,288.8	$405.0	$1,693.8
2013	$749.9	$426.7	$1,176.6	$393.6	$1,570.2
2014	$392.9	$258.0	$650.9	$296.3	$947.2
2015	$493.9	$351.9	$845.7	$436.3	$1,282.0
2016	$600.5	$391.1	$991.6	$508.2	$1,499.8
2017	$531.3	$345.9	$877.3	$455.6	$1,332.9
2018	$480.9	$314.1	$795.0	$400.6	$1,195.3
2019 YTD	$467.3	$342.0	$809.2	$401.5	$1,210.8
2019 YTD % Change YOY	14.3%	31.4%	20.9%	18.2%	20.0%
2019 Ann.	$560.7	$410.4	$971.1	$481.8	$1,452.9

Ginnie Mae Breakdown: Agency Gross Issuance				
Issuance Year	FHA	VA	Other	Total
2000	$80.2	$18.8	$3.2	$102.2
2001	$133.8	$34.7	$3.1	$171.5
2002	$128.6	$37.9	$2.5	$169.0
2003	$147.9	$62.7	$2.5	$213.1
2004	$85.0	$31.8	$2.5	$119.2
2005	$55.7	$23.5	$2.1	$81.4
2006	$51.2	$23.2	$2.3	$76.7
2007	$67.7	$24.2	$3.0	$94.9
2008	$221.7	$39.0	$6.9	$267.6
2009	$359.9	$74.6	$16.8	$451.3
2010	$304.9	$70.6	$15.3	$390.7
2011	$216.1	$82.3	$16.9	$315.3
2012	$253.4	$131.3	$20.3	$405.0
2013	$239.2	$132.2	$22.2	$393.6
2014	$163.9	$111.4	$21.0	$296.3
2015	$261.5	$155.6	$19.2	$436.3
2016	$281.8	$206.5	$19.9	$508.2
2017	$257.6	$177.8	$20.2	$455.6
2018	$222.6	$160.8	$17.2	$400.6
2019 YTD	$214.2	$174.6	$12.8	$401.5
2019 YTD % Change YOY	13.3%	28.2%	-12.6%	18.2%
2019 Ann.	$257.0	$209.5	$15.3	$481.8

Sources: *eMBS and Urban Institute (top and bottom).*
Note : *Dollar amounts are in billions. "Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. All data is as of October 2019.*

US Agency Market, Originations

Agency net issuance totaled $241.0 billion in the first ten months of 2019, up 11.7 percent compared to the same period in 2018. Ginnie Mae net issuance was $85.6 billion, comprising 35.5 percent of total agency net issuance. Ginnie Mae net issuance was down 10.7 percent compared to the same period in 2018, while GSE net issuance was up 29.7 percent over the same period. Ginnie Mae net issuance in the first ten months of 2019 was comprised of 60.9 percent VA and 37.5 percent FHA.

Agency Net Issuance

Issuance Year	Fannie Mae	Freddie Mac	GSE Total	Ginnie Mae	Total
2000	$92.0	$67.8	$159.8	$29.3	$189.1
2001	$216.6	$151.8	$368.4	-$9.9	$358.5
2002	$218.9	$138.3	$357.2	-$51.2	$306.1
2003	$293.7	$41.1	$334.9	-$77.6	$257.3
2004	$32.3	$50.2	$82.5	-$40.1	$42.4
2005	$62.5	$111.7	$174.2	-$42.2	$132.0
2006	$164.3	$149.3	$313.6	$0.2	$313.8
2007	$296.1	$218.8	$514.9	$30.9	$545.7
2008	$213.0	$101.8	$314.8	$196.4	$511.3
2009	$208.1	$42.5	$250.6	$257.4	$508.0
2010	-$156.4	-$146.8	-$303.2	$198.3	-$105.0
2011	-$32.6	-$95.8	-$128.4	$149.6	$21.2
2012	$32.9	-$75.3	-$42.4	$119.1	$76.8
2013	$57.5	$11.6	$69.1	$87.9	$157.0
2014	$0.5	$30.0	$30.5	$61.6	$92.1
2015	$10.2	$65.0	$75.1	$97.3	$172.5
2016	$68.6	$66.8	$135.5	$125.3	$260.8
2017	$90.2	$78.2	$168.5	$131.3	$299.7
2018	$79.4	$68.4	$147.7	$113.9	$261.6
2019 YTD	$68.2	$87.2	$155.4	$85.6	$241.0
2019 YTD % Change YOY	-0.7%	70.4%	29.7%	-10.7%	11.7%
2019 Ann.	$81.8	$104.6	$186.5	$102.7	$289.2

Ginnie Mae Breakdown: Net Issuance

Issuance Year	FHA	VA	Other	Total
2000	$29.0	$0.3	$0.0	$29.3
2001	$0.7	-$10.6	$0.0	-$9.9
2002	-$22.5	-$28.7	$0.0	-$51.2
2003	-$56.5	-$21.1	$0.0	-$77.6
2004	-$45.2	$5.1	$0.0	-$40.1
2005	-$37.3	-$12.1	$7.2	-$42.2
2006	-$4.7	$3.8	$1.2	$0.2
2007	$20.2	$8.7	$2.0	$30.9
2008	$173.3	$17.7	$5.4	$196.4
2009	$206.4	$35.1	$15.8	$257.4
2010	$158.6	$29.6	$10.0	$198.3
2011	$102.8	$34.0	$12.8	$149.6
2012	$58.9	$45.9	$14.3	$119.1
2013	$20.7	$53.3	$13.9	$87.9
2014	-$4.8	$53.9	$12.5	$61.6
2015	$22.5	$66.9	$7.9	$97.3
2016	$45.6	$73.2	$6.0	$124.9
2017	$50.1	$76.1	$5.0	$131.3
2018	$49.2	$61.2	$3.5	$113.9
2019 YTD	$32.1	$52.1	$1.4	$85.6
2019 YTD % Change YOY	-22.6%	1.7%	-55.2%	-10.7%
2019 Ann.	$38.5	$62.6	$1.7	$102.7

Sources: *eMBS and Urban Institute.* **Note :** *Dollar amounts are in billions. "Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. All data is as of October 2019.*

US Agency Market, Originations

Agency gross issuance moves inversely to interest rates, generally declining as interest rates rise, increasing when interest rates fall, but the seasonal trend is also very strong. This table allows for a comparison with the same month in previous years. In 2019, January and February were lower than 2018, March was about the same, while April through October have been much higher, benefitting from the decline in interest rates. The October 2019 gross agency issuance of $169.6 billion is well above the October 2018 level of $100.3 billion.

Monthly Agency Issuance

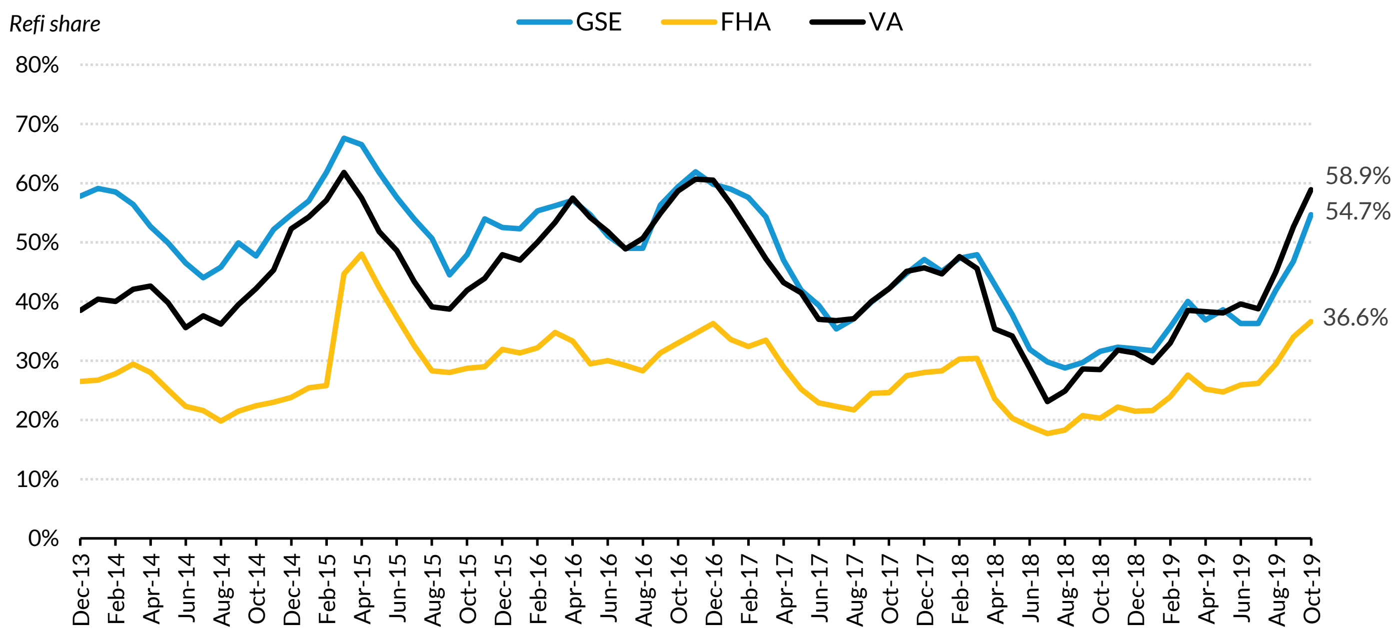
	Gross Issuance				Net Issuance			
Date	Fannie Mae	Freddie Mac	Ginnie Mae	Total	Fannie Mae	Freddie Mac	Ginnie Mae	Total
Jan-16	$35.6	$22.5	$32.5	$90.6	-$0.6	$1.0	$7.3	$7.8
Feb-16	$32.4	$21.2	$30.5	$84.1	$2.4	$3.1	$8.4	$13.9
Mar-16	$39.7	$27.5	$32.9	$100.1	$7.9	$8.2	$9.6	$25.8
Apr-16	$43.8	$26.2	$40.1	$110.1	$0.8	-$0.2	$8.8	$9.4
May-16	$44.2	$29.9	$41.6	$115.6	$2.4	$4.4	$11.4	$18.3
Jun-16	$46.7	$30.1	$43.9	$120.8	$2.7	$3.0	$11.9	$17.7
Jul-16	$49.8	$35.3	$46.1	$131.1	$2.3	$6.3	$10.8	$19.4
Aug-16	$54.9	$37.9	$46.7	$139.5	$10.4	$11.0	$13.8	$35.2
Sep-16	$65.8	$44.0	$52.5	$162.4	$8.7	$9.0	$12.5	$30.2
Oct-16	$66.0	$35.9	$47.4	$149.3	$11.8	$2.7	$9.3	$24.5
Nov-16	$48.8	$40.2	$47.2	$136.3	-$3.5	$7.9	$10.3	$14.8
Dec-16	$72.7	$40.5	$46.8	$160.0	$23.3	$10.4	$10.8	$44.6
Jan-17	$55.6	$38.5	$42.6	$136.6	$10.3	$10.7	$10.3	$31.9
Feb-17	$37.6	$27.4	$33.1	$98.1	$3.1	$6.5	$9.2	$18.9
Mar-17	$39.5	$24.4	$31.3	$95.2	$10.3	$6.2	$9.6	$26.3
Apr-17	$39.3	$21.2	$36.4	$97.0	$4.8	$0.4	$11.7	$17.3
May-17	$40.3	$22.6	$36.4	$99.3	$7.6	$2.7	$13.1	$23.6
Jun-17	$45.7	$25.1	$39.9	$110.7	$8.3	$2.4	$13.2	$24.1
Jul-17	$45.3	$27.6	$40.6	$113.5	$5.8	$3.5	$12.1	$21.5
Aug-17	$49.1	$29.3	$42.8	$121.1	$12.0	$6.7	$15.6	$33.9
Sep-17	$47.3	$27.9	$40.2	$115.5	$7.4	$3.8	$10.5	$21.7
Oct-17	$42.9	$34.6	$38.4	$115.9	$6.4	$12.5	$10.7	$29.6
Nov-17	$43.5	$37.2	$37.8	$118.5	$4.6	$13.6	$8.2	$26.4
Dec-17	$45.3	$30.0	$36.2	$111.5	$9.6	$8.2	$6.8	$24.6
Jan-18	$47.4	$21.4	$35.2	$104.0	$12.4	$0.3	$7.8	$20.6
Feb-18	$40.3	$21.5	$31.9	$93.7	$8.0	$2.3	$7.1	$17.4
Mar-18	$35.6	$21.3	$29.0	$85.9	$4.9	$3.0	$6.1	$14.0
Apr-18	$36.3	$26.2	$32.7	$95.2	$1.7	$6.1	$9.1	$16.8
May-18	$38.9	$27.5	$33.7	$100.1	$4.5	$7.2	$10.6	$22.4
Jun-18	$38.2	$28.8	$35.6	$102.5	$2.2	$6.8	$10.5	$19.5
Jul-18	$40.3	$26.2	$35.6	$102.1	$4.2	$3.7	$10.7	$18.6
Aug-18	$50.4	$29.9	$37.5	$117.8	$14.9	$7.9	$12.8	$35.6
Sep-18	$41.8	$30.1	$34.8	$106.6	$5.7	$6.2	$9.1	$21.0
Oct-18	$39.8	$27.4	$33.2	$100.3	$10.1	$7.6	$12.1	$29.7
Nov-18	$35.1	$30.1	$32.4	$97.6	$2.6	$10.8	$9.6	$22.9
Dec-18	$36.9	$23.9	$28.4	$89.1	$8.2	$6.4	$8.4	$23.0
Jan-19	$33.3	$19.2	$29.0	$81.6	$5.5	$2.5	$9.5	$17.5
Feb-19	$27.3	$19.9	$23.5	$70.7	$1.2	$3.6	$4.6	$9.5
Mar-19	$29.6	$27.3	$26.6	$83.5	$1.9	$10.3	$5.8	$18.0
Apr-19	$33.1	$30.8	$32.9	$96.8	$0.6	$11.0	$8.5	$20.1
May-19	$44.5	$34.3	$38.8	$117.6	$7.0	$10.3	$9.4	$26.7
Jun-19	$44.6	$34.0	$43.3	$121.9	$1.6	$6.2	$9.2	$16.9
Jul-19	$51.7	$36.9	$45.9	$134.5	$10.3	$10.3	$10.8	$31.4
Aug-19	$71.1	$50.4	$51.2	$172.6	$20.4	$17.5	$8.9	$46.8
Sep-19	$67.1	$43.0	$52.0	$162.1	$13.0	$7.9	$6.9	$27.8
Oct-19	$65.0	$46.2	$58.4	$169.6	$6.6	$7.7	$12.0	$26.3

***Note :** Dollar amounts are in billions. “Other“ refers to loans insured by HUD’s Office of Public and Indian Housing and the Department of Agriculture’s Rural Development. All data is as of October 2019.*

US Agency Market, Originations

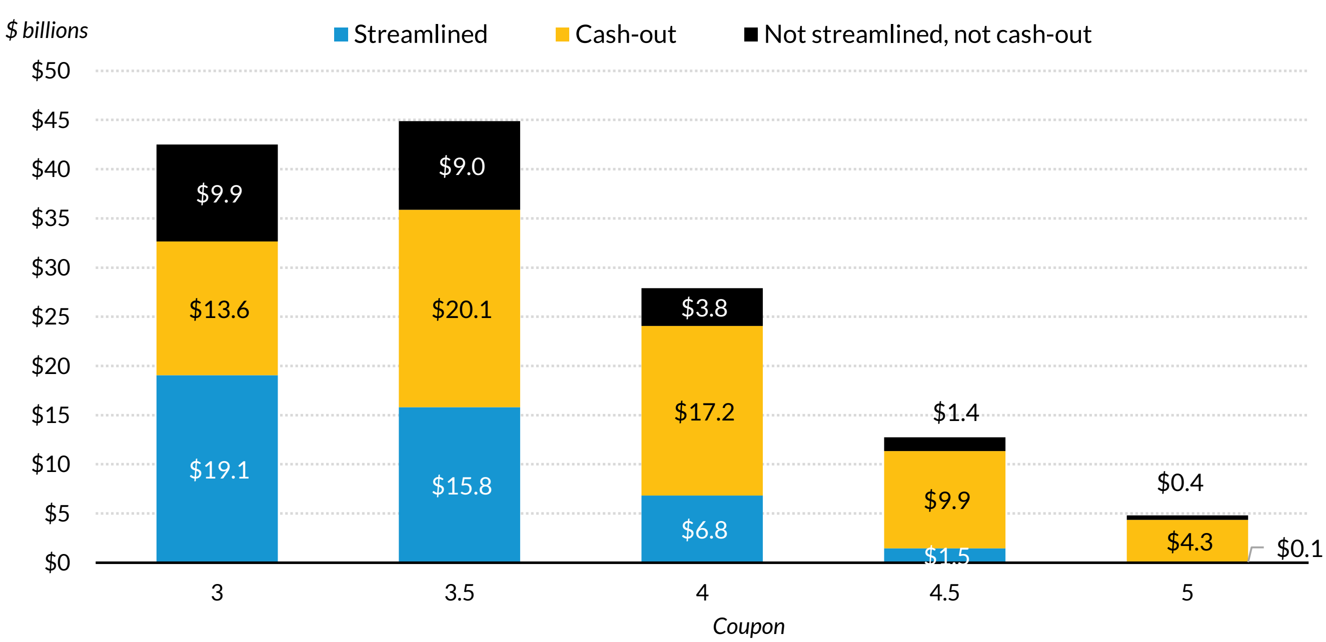
The FHA refinance share stood at 36.6 percent in October 2019, below the 58.9 percent refi share for VA originations and the 54.7 percent share for the GSEs. Refinances as a share of all originations have grown in 2019 as interest rates have fallen. The bottom section, focusing exclusively on Ginnie Mae, shows that streamlined refinances are more common in lower coupon pools. By contrast, cash out refinances are relatively more important for higher coupon borrowers; as these borrowers are usually more credit constrained.

Percent Refi at Issuance



Sources: *eMBS and Urban Institute.* **Note**: *Based on at-issuance balance. Data as of October 2019.*

Ginnie Mae Refinance Issuance by Type: 2019 YTD

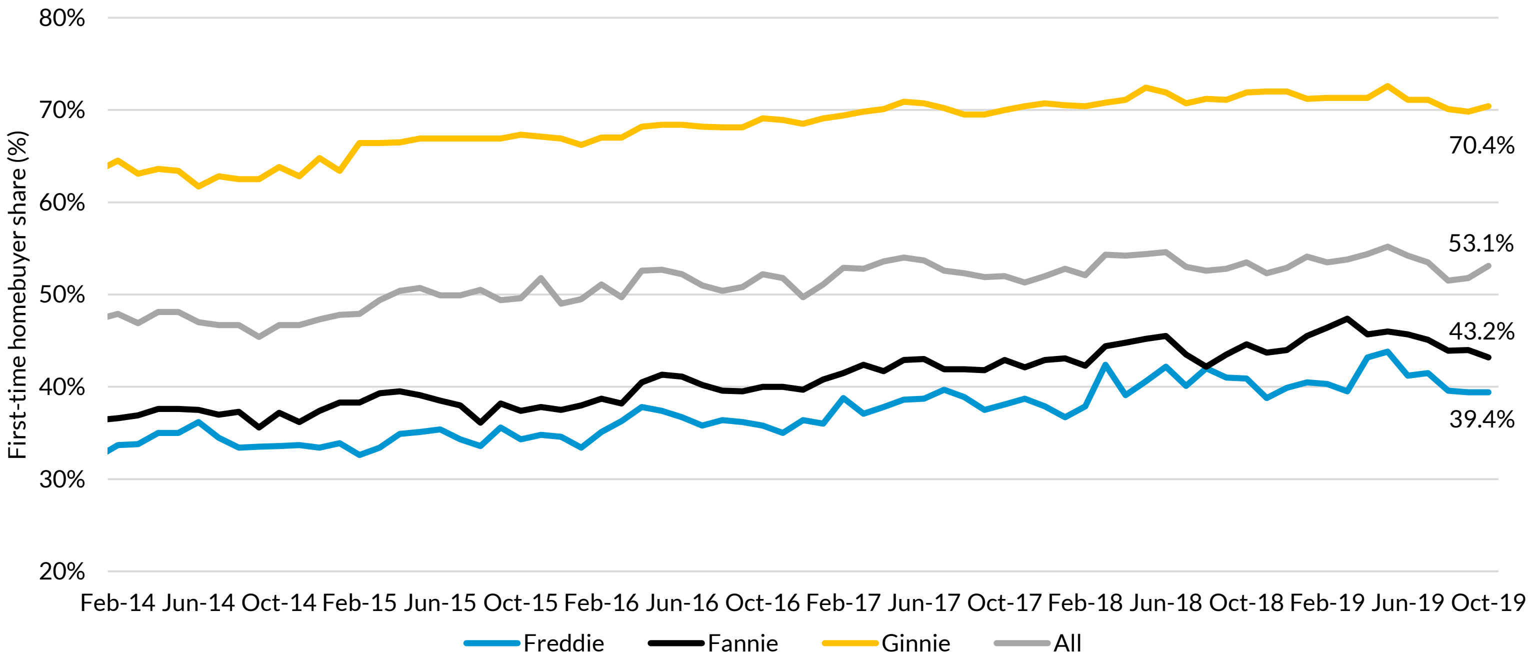


Sources: *eMBS and Urban Institute.*
Note: *Based on at-issuance balance. Data as of October 2019.*

Credit Box

The first time homebuyer share of Ginnie Mae purchase loans was 70.4 percent in October 2019, down slightly from its historical high in May due to increased refinance activity amidst lower rates. First time homebuyers comprise a significantly higher share of the Ginnie Mae purchase market than of the GSE purchase market, with first time homebuyers accounting for 43.2 percent and 39.4 percent of Fannie Mae and Freddie Mac purchase originations respectively. The bottom table shows that based on mortgages originated in October 2019, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan, have a lower credit score, a much higher LTV, a similar DTI, and pay a slightly higher rate.

First Time Homebuyer Share: Purchase Only Loans



Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

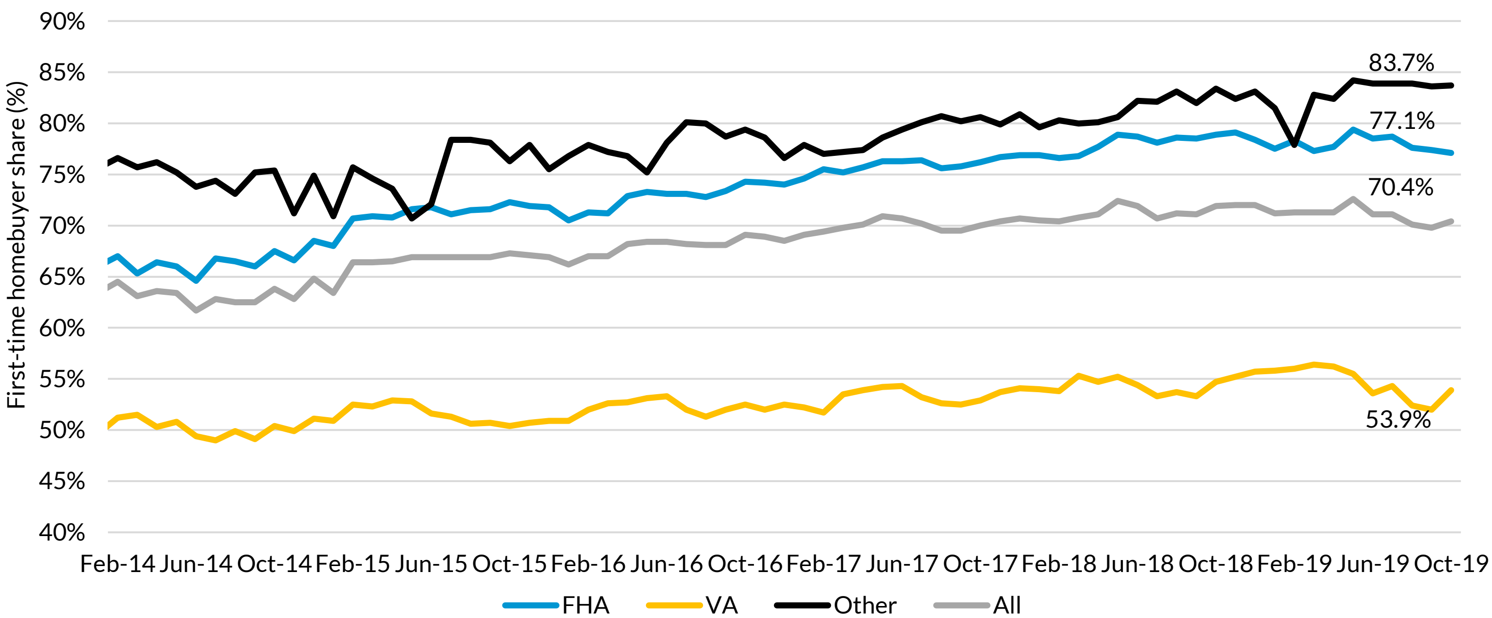
	Fannie Mae		Freddie Mac		Ginnie Mae		All	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount ($)	256,447	286,888	255,000	276,235	222,210	268,785	237,922	277,988
Credit Score	740.6	754.8	745.4	757.4	680.3	701.4	709.4	739.6
LTV (%)	88.2	78.9	87.3	79.8	96.9	95.4	92.6	84.1
DTI (%)	35.5	36.1	34.8	35.7	41.4	42.3	38.5	37.8
Loan Rate (%)	4.0	3.9	4.0	3.9	4.0	3.8	4.0	3.9

Sources: *eMBS and Urban Institute.*
Note: *In May 2017 Ginnie Mae began disclosing issuer-reported LTV for FHA loans, which includes the financed upfront mortgage insurance premium. To make it consistent with the previously reported LTV, we removed the financed upfront mortgage insurance premium by subtracting 169 bps from this new issuer-reported LTV. Data as of October 2019.*

Credit Box

Within the Ginnie Mae purchase market, 77.1 percent of FHA loans, 53.9 percent of VA loans and 83.7 percent of other loans represent financing for first-time home buyers in October 2019. The bottom table shows that based on mortgages originated in October 2019, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan, have a lower credit score, higher LTV, similar DTI and pay a higher rate.

First Time Homebuyer Share: Ginnie Mae Breakdown



Sources: *eMBS and Urban Institute.* **Note**: *Includes only purchase loans. Data as of October 2019.*

	FHA		VA		Other		Ginnie Mae Total	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount ($)	219,071	233,708	260,223	311,702	152,697	169,151	222,210	268,785
Credit Score	670.4	671.9	700.7	729.2	695.9	703.3	680.3	701.4
LTV (%)	95.4	94.0	99.7	96.3	99.2	99.1	96.9	95.4
DTI (%)	42.9	43.8	40.1	41.5	34.8	35.5	41.4	42.3
Loan Rate (%)	4.1	4.0	3.8	3.6	3.9	3.9	4.0	3.8

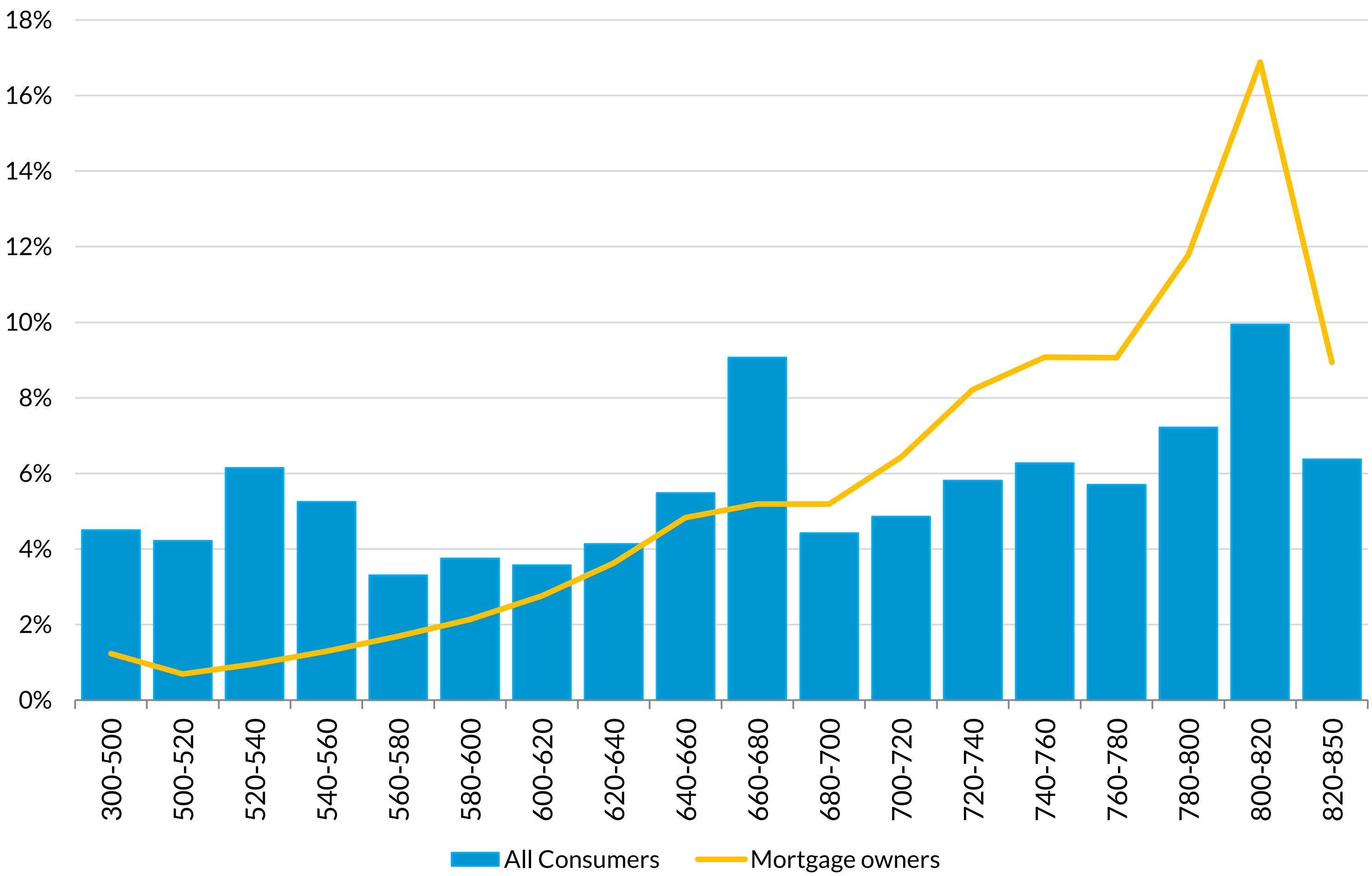
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019. "Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. In May 2017 Ginnie Mae began disclosing issuer-reported LTV for FHA loans, which includes the financed upfront mortgage insurance premium. To make it consistent with the previously reported LTV, we removed the financed upfront mortgage insurance premium by subtracting 169 bps from this new issuer-reported LTV.*

Credit Box

Consumers who have a mortgage are concentrated at the high end of the general credit score spectrum. The top table shows that the median FICO score for all consumers (682) is equal to the 25th percentile of those with a mortgage (682).

FICO Score Distribution: Mortgage Owners vs All Consumers

All Consumers- Percentiles								
Minimum	**P5**	**P10**	**P25**	**P50**	**P75**	**P90**	**P95**	**Maximum**
300	503	524	587	682	774	813	822	839
Mortgage Owners- Percentiles								
Minimum	**P5**	**P10**	**P25**	**P50**	**P75**	**P90**	**P95**	**Maximum**
300	570	615	682	752	801	818	824	839



Sources: *Credit Bureau Data and Urban Institute.*
Note: *Data as of August 2017.*

October 2019 Credit Box at a Glance

In October 2019, the median Ginnie Mae FICO score was 683 versus 759 for Fannie Mae and 760 for Freddie Mac. Note that the FICO score for the 10th percentile was 622 for Ginnie Mae, versus 688 for Fannie Mae and 691 for Freddie Mac. Within the Ginnie Mae market, FHA loans have a median FICO score of 666, VA loans have a median FICO score of 714 and other loans have a median FICO score of 693.

Purchase FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	304,923	642	680	732	776	797	725
Fannie	101,397	686	719	757	786	801	750
Freddie	81,003	693	725	761	788	802	754
Ginnie	122,523	622	645	678	725	772	687
Refi FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	305,813	657	699	746	780	799	735
Fannie	132,242	689	723	760	787	802	752
Freddie	87,917	689	722	759	785	801	751
Ginnie	85,654	623	652	690	738	779	694
All FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	610,736	648	689	740	778	798	730
Fannie	233,639	688	721	759	786	801	751
Freddie	168,920	691	724	760	787	801	752
Ginnie	208,177	622	647	683	731	775	690

Purchase FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	122,523	622	645	678	725	772	687
FHA	73,579	616	639	665	699	738	671
VA	38,484	632	664	715	768	795	714
Other	10,460	640	660	693	733	765	697
Refi FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	85,654	623	652	690	738	779	694
FHA	36,935	612	639	668	700	737	670
VA	48,426	634	669	713	761	790	712
Other	293	647	671	703	739	771	704
All FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	208,177	622	647	683	731	775	690
FHA	110,514	614	639	666	700	738	671
VA	86,910	633	667	714	764	792	713
Other	10,753	640	660	693	733	765	697

Sources: *eMBS and Urban Institute.* **Note:** *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

October 2019 Credit Box at a Glance

In October 2019, the median loan-to-value ratio (LTV) was 96.5 percent for Ginnie Mae, 78 percent for Fannie Mae and 80 percent for Freddie Mac. The 90th percentile was 101.0 percent for Ginnie Mae, and 95 percent for both Freddie and Fannie. Within the Ginnie Mae market, the median LTV was 96.5 for FHA, 100.0 for VA and 101.9 for other programs.

Purchase LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	305,173	73.0	80.0	95.0	96.5	100.0	88.0
Fannie	101,275	63.0	79.0	85.0	95.0	97.0	82.5
Freddie	81,110	64.0	80.0	80.0	95.0	95.0	82.2
Ginnie	122,788	92.6	96.5	96.5	100.0	101.7	96.4
Refi LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	312,971	50.0	65.0	76.9	86.5	97.2	74.6
Fannie	132,243	46.0	59.0	71.0	80.0	85.0	67.9
Freddie	87,990	47.0	60.0	73.0	80.0	85.0	68.9
Ginnie	92,738	74.8	84.9	92.4	98.5	100.0	89.5
All LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	618,144	57.0	73.0	83.3	96.4	98.7	81.2
Fannie	233,518	50.0	65.0	78.0	87.0	95.0	74.2
Freddie	169,100	52.0	68.0	80.0	88.0	95.0	75.3
Ginnie	215,526	81.9	90.7	96.5	99.9	101.0	93.4

Purchase LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	122,788	92.6	96.5	96.5	100.0	101.7	96.4
FHA	73,719	92.9	96.5	96.5	96.5	96.5	95.1
VA	38,560	91.1	100.0	100.0	102.2	103.0	98.1
Other	10,509	95.3	99.1	101.0	101.0	101.0	99.2
Refi LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	92,738	74.8	84.9	92.4	98.5	100.0	89.5
FHA	39,985	73.8	83.3	86.5	96.4	98.1	86.7
VA	52,407	75.8	86.7	96.1	100.0	101.0	91.6
Other	346	83.0	93.6	100.0	101.6	102.7	95.3
All LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	215,526	81.9	90.7	96.5	99.9	101.0	93.4
FHA	113,704	82.4	89.3	96.5	96.5	96.7	92.2
VA	90,967	80.1	91.0	100.0	100.0	102.2	94.4
Other	10,855	95.0	99.0	100.9	101.0	101.0	99.1

Sources: *eMBS and Urban Institute.* **Note:** *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. In May 2017 Ginnie Mae began disclosing issuer-reported LTV for FHA loans, which includes the financed upfront mortgage insurance premium. To make it consistent with the previously reported LTV, we removed the financed upfront mortgage insurance premium by subtracting 169 bps from this new issuer-reported LTV. Data as of October 2019.*

October 2019 Credit Box at a Glance

In October 2019, the median Ginnie Mae debt-to-income ratio (DTI) was 41.8 percent, considerably higher than the 36.0 percent median DTI for both Freddie Mac and Fannie Mae. The 90th percentile for Ginnie Mae was 54.0 percent, also much higher than the 47.0 and 46.0 percent DTI for Fannie Mae and Freddie Mac, respectively. Within the Ginnie Mae market, the median FHA DTI ratio was 43.9 percent, versus 40.3 percent for VA and 35.9 percent for other lending programs.

Purchase DTI							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	305,012	24.0	31.0	39.0	45.0	50.0	37.9
Fannie	101,486	22.0	29.0	37.0	43.0	47.0	35.7
Freddie	81,107	22.0	29.0	36.0	43.0	47.0	35.2
Ginnie	122,419	28.6	35.3	42.3	48.9	54.1	41.7
Refi DTI							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	272,414	21.0	28.0	36.0	43.0	48.0	35.0
Fannie	132,225	21.0	27.0	35.0	42.0	46.0	33.9
Freddie	87,987	21.0	27.0	35.0	42.0	46.0	34.2
Ginnie	52,202	23.1	31.8	40.3	48.2	53.7	39.2
All DTI							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	577,426	22.7	29.4	37.6	44.0	49.0	36.6
Fannie	233,711	21.0	28.0	36.0	43.0	47.0	34.7
Freddie	169,094	21.0	28.0	36.0	42.0	46.0	34.7
Ginnie	174,621	27.0	34.1	41.8	48.7	54.0	40.9

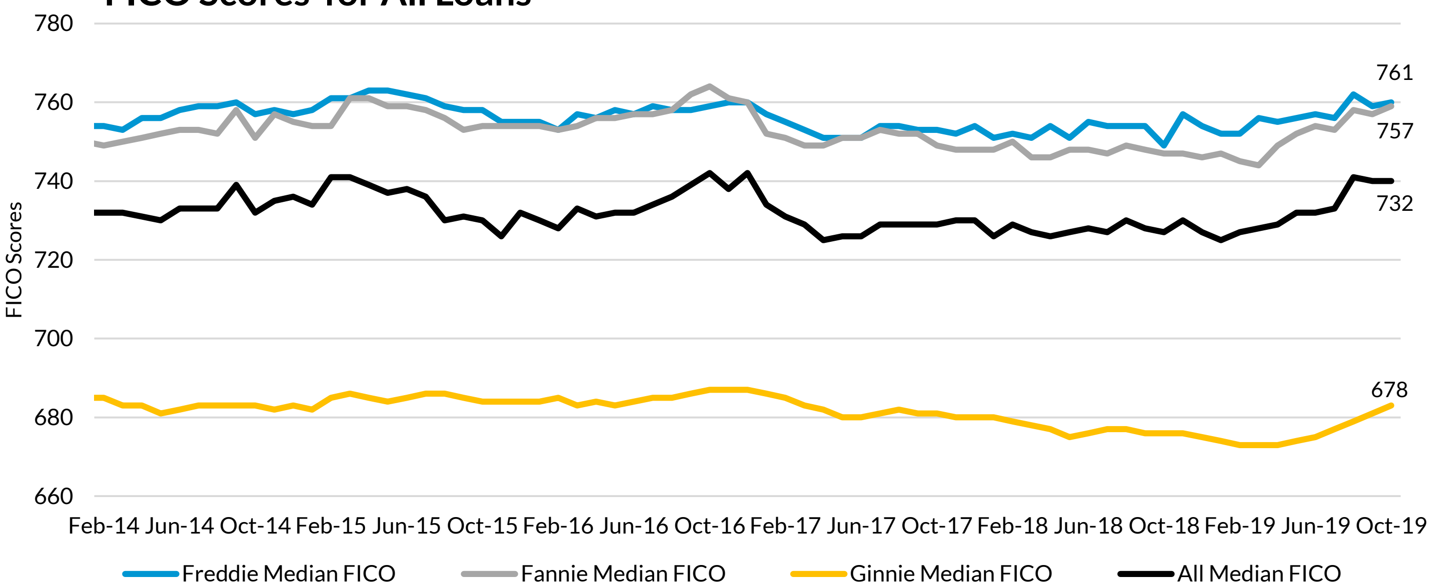
Purchase DTI: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	122,419	28.6	35.3	42.3	48.9	54.1	41.7
FHA	73,681	30.5	37.2	44.1	50.0	54.6	43.1
VA	38,242	26.7	33.7	41.3	48.2	53.8	40.7
Other	10,496	25.6	30.5	35.9	40.0	43.0	34.9
Refi DTI: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	52,202	23.1	31.8	40.3	48.2	53.7	39.2
FHA	25,653	28.4	34.9	43.3	49.9	54.5	42.0
VA	26,279	19.3	28.6	37.3	45.8	52.2	36.7
Other	270	14.2	19.1	27.7	36.7	40.8	27.8
All DTI: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	158,844	27.5	34.4	42.0	48.9	54.1	41.2
FHA	92,150	30.0	36.7	43.9	50.1	54.6	42.9
VA	56,471	24.8	32.0	40.3	47.7	53.5	39.6
Other	10,223	25.3	30.3	35.9	40.0	42.8	34.8

Sources: *eMBS and Urban Institute.* **Note**: *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

Credit Box: Historical

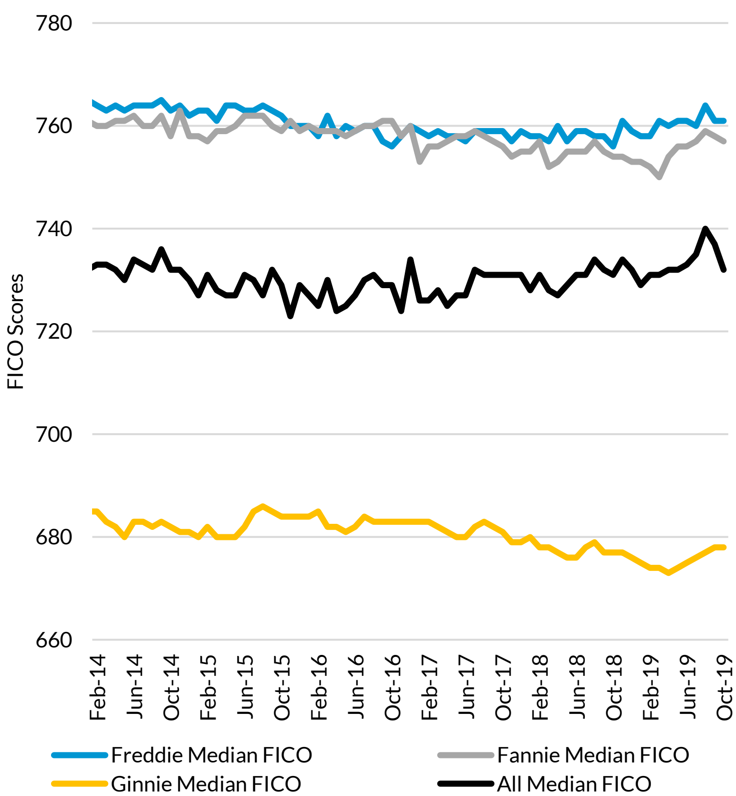
The median FICO score for all agency loans originated in October 2019 was 732, down from 737 last month, but up considerably on the year, owing to the refinance wave, which higher FICO borrowers take advantage of with greater frequency. The figures show that the median FICO score for Ginnie Mae borrowers has always been considerably lower than for GSE borrowers. Since early 2019, the median FICO scores for Fannie, Freddie and Ginnie borrowers have moved up for both purchase and refinance loans. The difference between Ginnie Mae and GSE borrower FICOs is slightly wider for purchase loans than for refi loans.

FICO Scores for All Loans



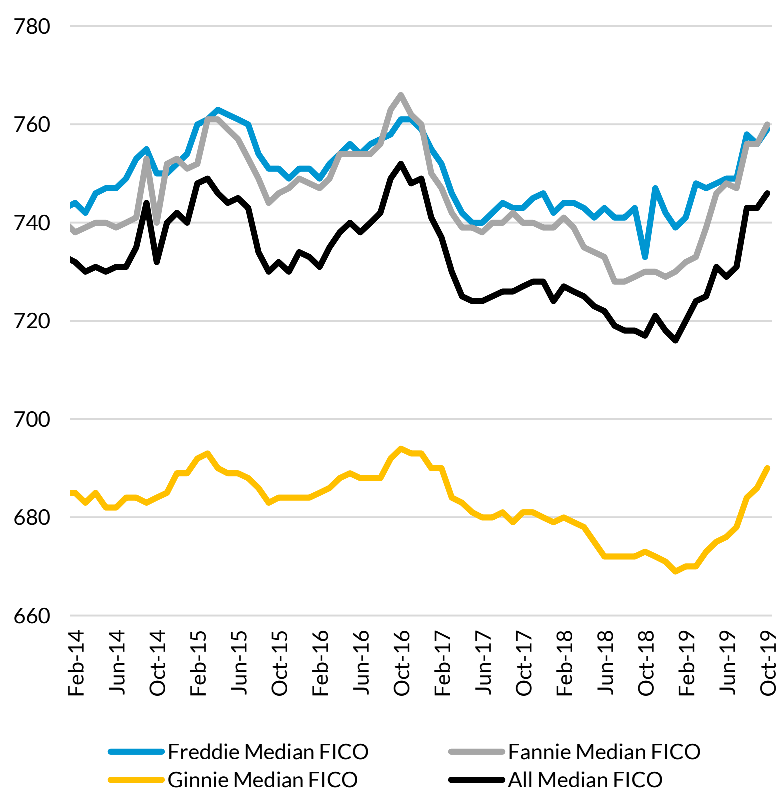
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

FICO Scores for Purchase Loans



Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2019.*

FICO Scores for Refinance Loans

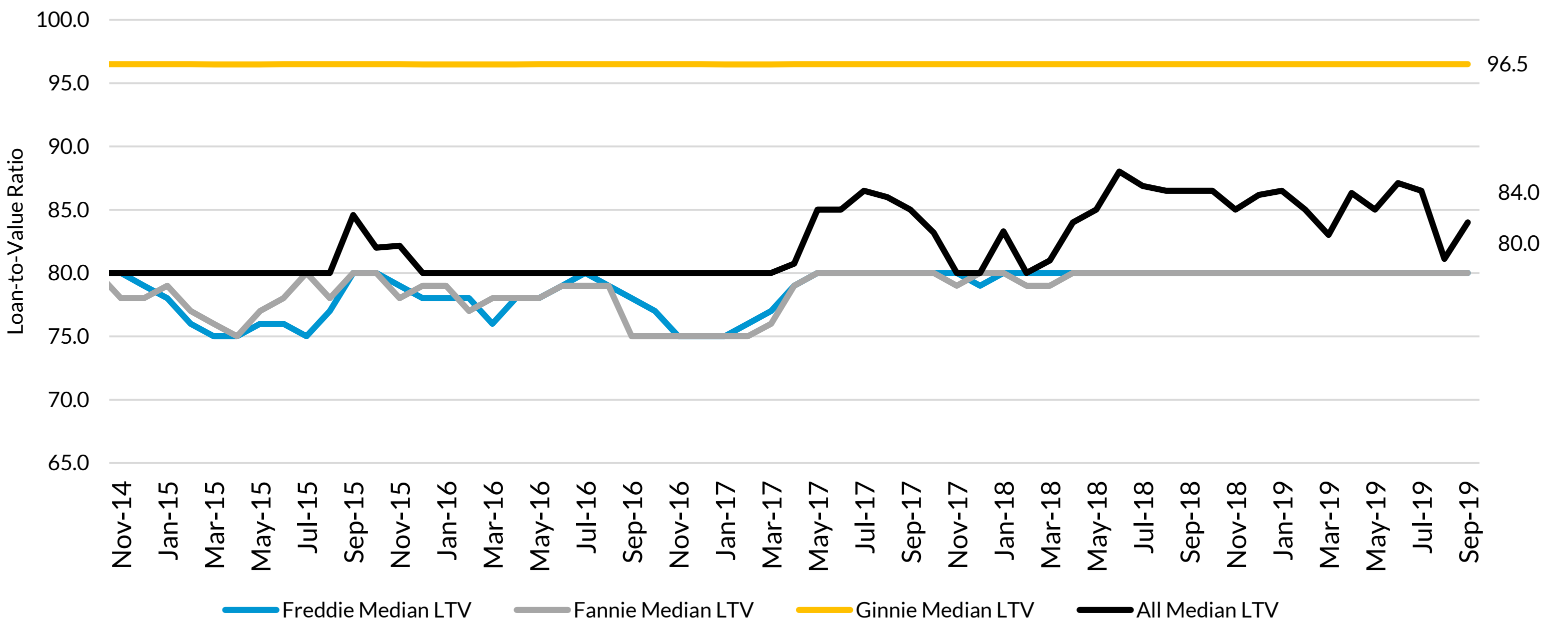


Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2019.*

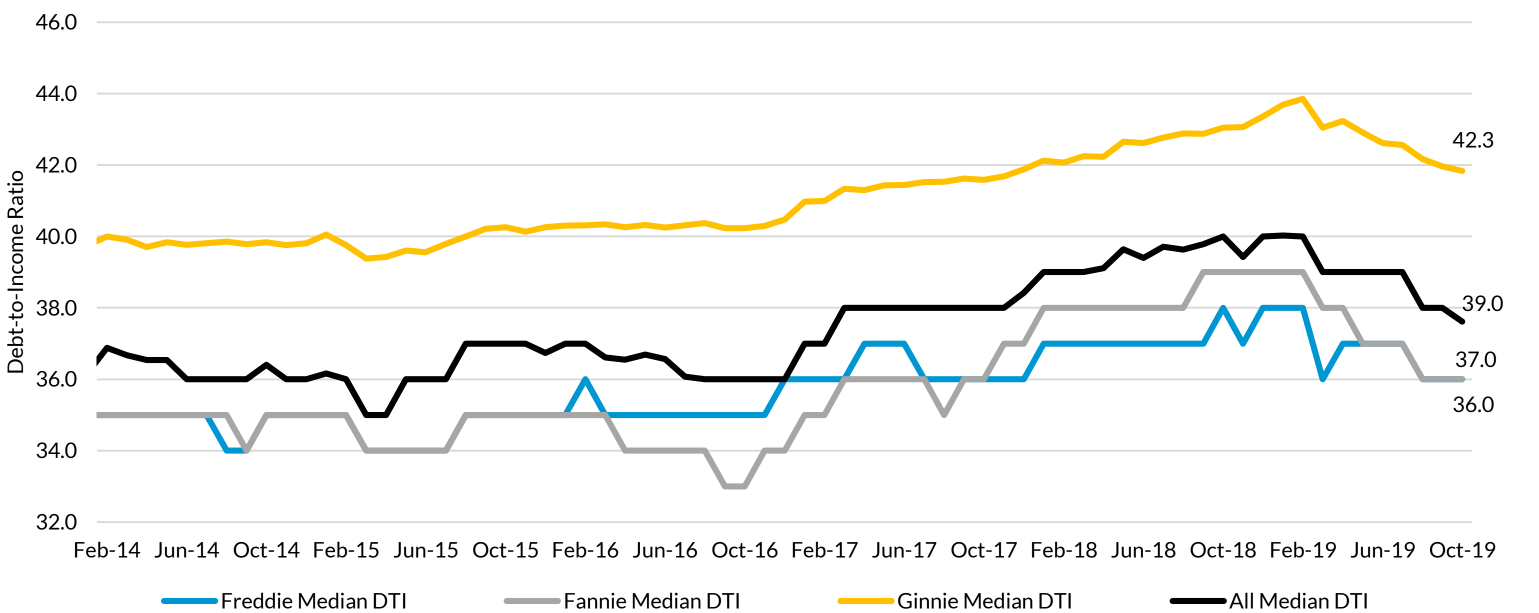
Credit Box: Historical

Median LTVs for Ginnie Mae loans have historically been at 96.5 percent, much higher than the 80 – 85 LTVs for the GSEs. Median debt-to-income ratios for Ginnie Mae loans have historically been in the low 40s, considerably higher than for the GSEs. DTIs increased in the 2017-2018 period for both Ginnie Mae and GSE loans, with the movement more pronounced for Ginnie Mae. Increases in DTI are very typical in an environment of rising interest rates and rising home prices. All three agencies have witnessed measurable declines in DTIs in spring and summer 2019 driven by lower interest rates.

LTV Ratio for All Loans



DTI Ratio for All Loans

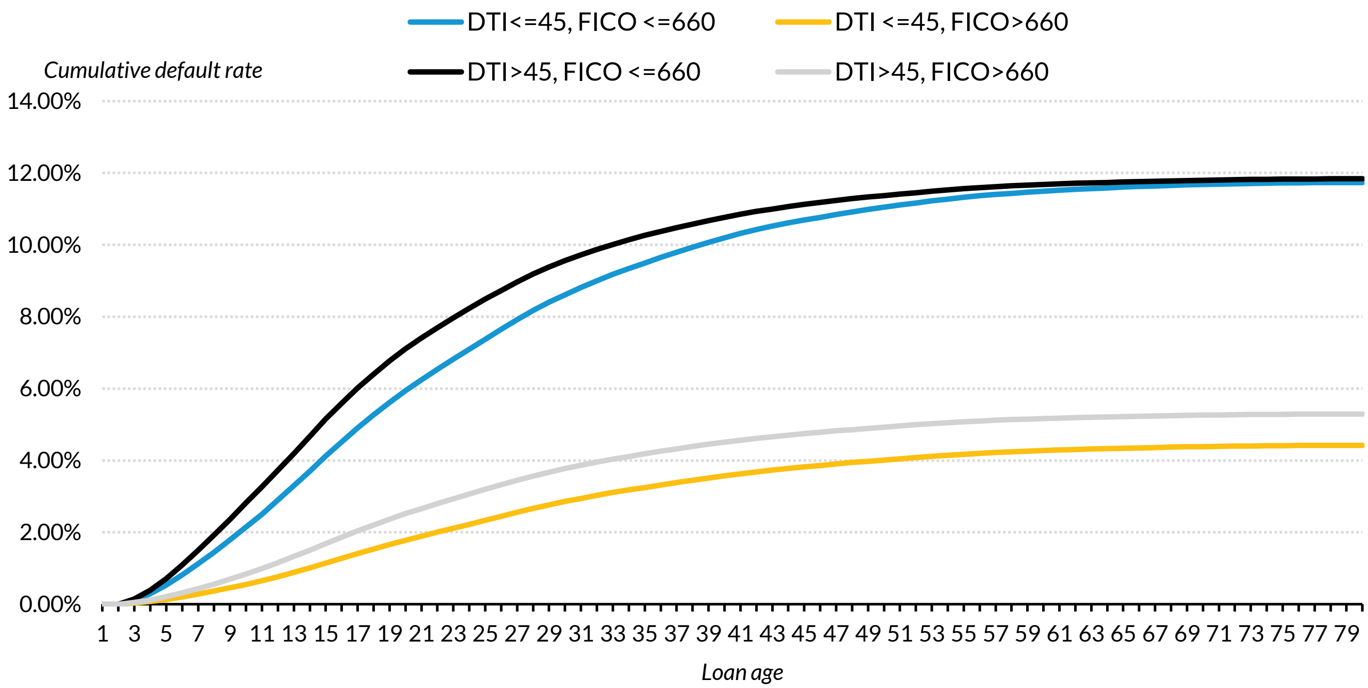


Sources: *eMBS and Urban Institute.* **Note:** *In May 2017 Ginnie Mae began disclosing issuer-reported LTV for FHA loans, which includes the financed upfront mortgage insurance premium. To make it consistent with the previously reported LTV, we removed the financed upfront mortgage insurance premium by subtracting 169 bps from this new issuer-reported LTV. Sources and note apply to all three graphs. Data as of October 2019.*

Credit Box: Historical

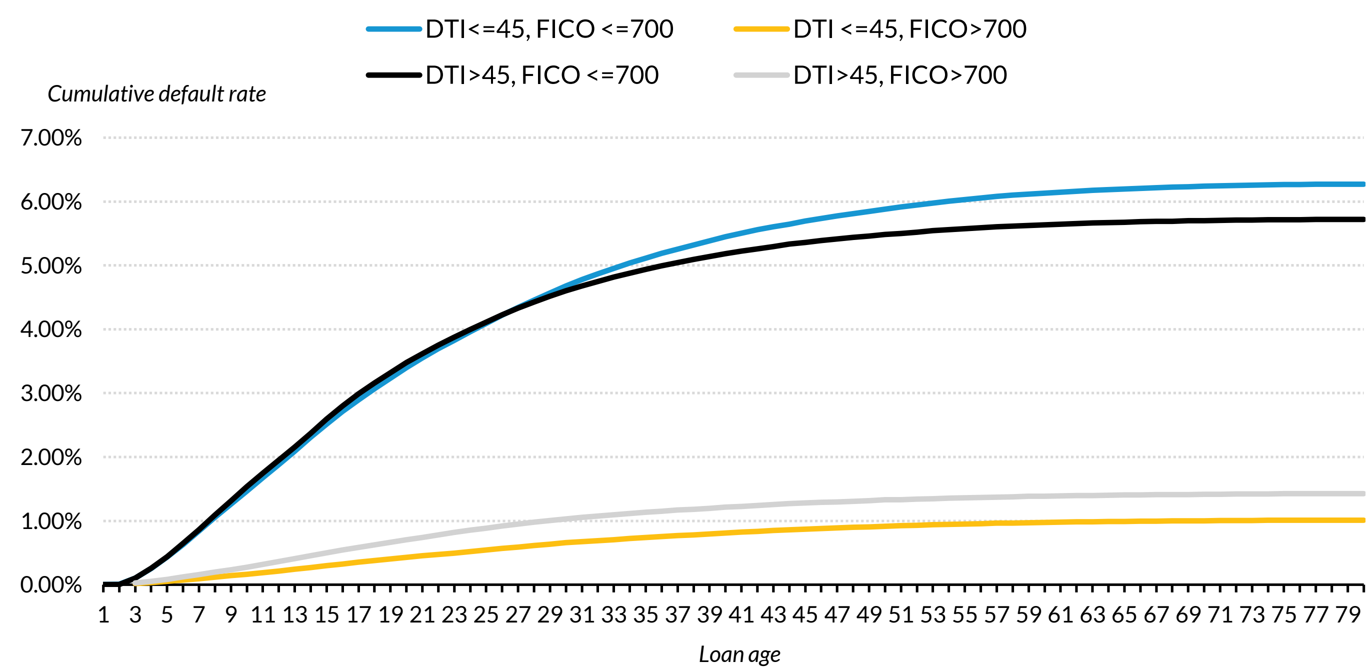
DTI is a much weaker predictor of performance than FICO score. The top chart shows FHA borrowers with higher DTIs do default more than those with lower DTIs, but the differences are modest, as evidenced by the fact that the black line is very close to the blue line and the grey line is not that much above the yellow line. By contrast, FICO makes a much larger difference, as can be seen by comparing the blue line to the yellow line or the black line to the gray line. And low DTI/low FICO borrowers default much less than high DTI/high FICO borrowers, as can be seen by comparing the blue line to the gray line. The bottom chart, for VA borrower illustrates the same point; DTI is a much weaker predictor of loan performance than credit score.

FHA Cumulative Default Rate by DTI and FICO



Sources: *eMBS and Urban Institute*. **Note:** Defaults = 180 days delinquent. *Data as of October 2019.*

VA Cumulative Default Rate by DTI and FICO

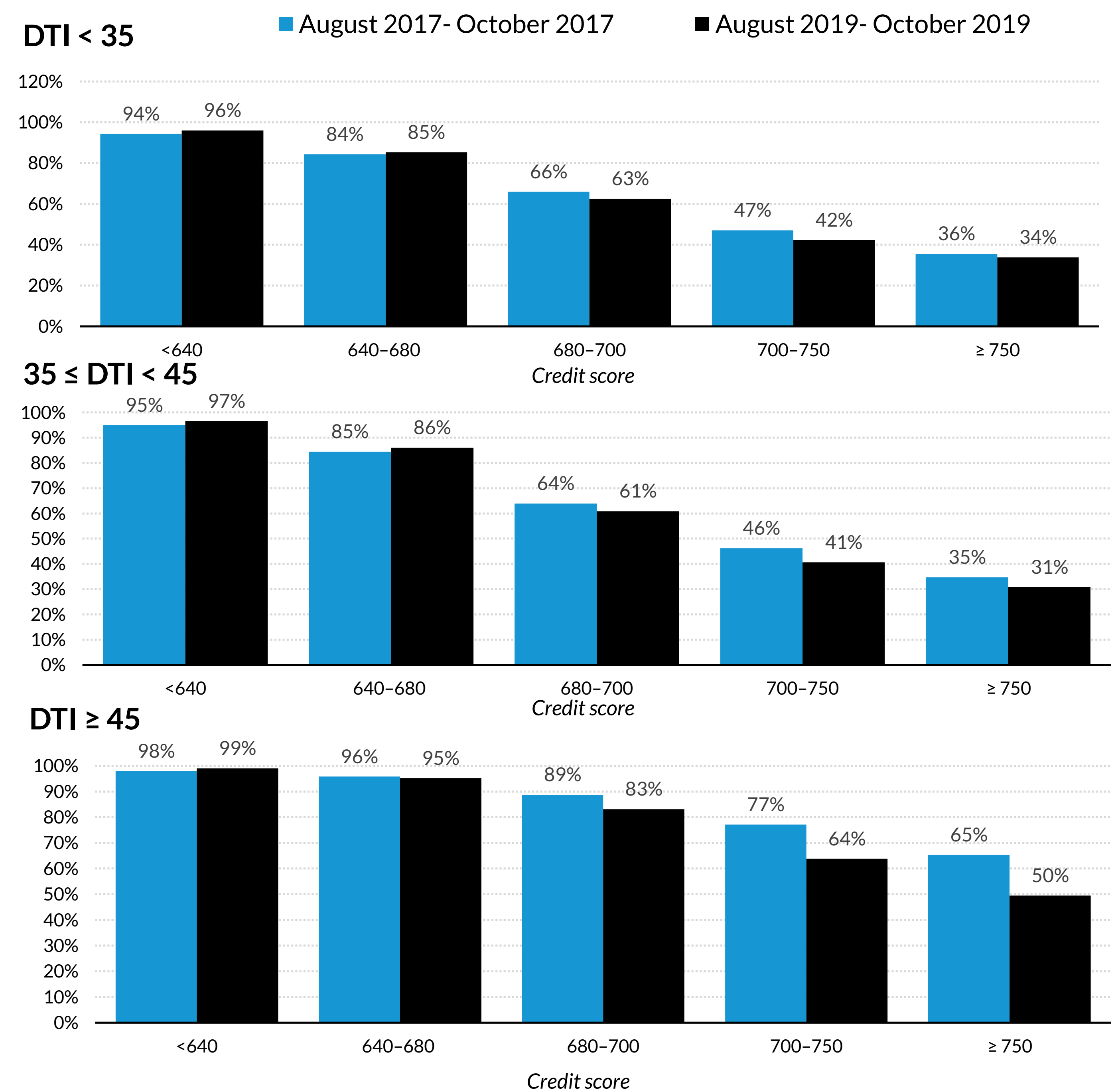


Sources: *eMBS and Urban Institute*. **Note:** Defaults = 180 days delinquent. *Data as of October 2019.*

Credit Box: Historical

This table shows Ginnie Mae's share of agency high-LTV lending by DTI and FICO. In each DTI bucket, Ginnie Mae's share is more concentrated in lower FICO scores than in higher FICO scores. In August 2019- October 2019, Ginnie Mae accounted for 96 percent of agency issuance for DTIs under 35 and FICOs below 640, compared to just 34 percent for DTIs below 35 and FICO 750 and higher. The Ginnie/GSE split in the 35-45 DTI bucket looks a lot like the below 35 percent DTI bucket. In August 2019– October 2019, Ginnie Mae's share of issuance was higher for DTIs of 45 and above, as compared with the two lower DTI buckets. Ginnie Mae share of loans with a DTI of 45 and above and a FICO of 680-700 was 83 percent; it was 61-63 percent for the same FICO in the lower DTI buckets. Comparing this period to 2 years earlier, it is clear that GSEs have stepped up their higher LTV lending in all but the lowest FICO buckets, taking market share from Ginnie Mae.

Ginnie Mae Share of Agency Market by DTI and FICO for Loans with LTV ≥ 95



Sources: *eMBS and Urban Institute.*

High LTV Loans: Ginnie Mae vs. GSEs

Ginnie Mae dominates high-LTV lending, with 68.9 percent of its issuances in the August 2019-October 2019 period having LTVs of 95 or above, compared to 16.8 percent for the GSEs. The GSEs have decreased their high-LTV lending share from 18.3 percent in August 2017−October 2017. Ginnie Mae's high-LTV lending is down just slightly over the same period from 70.5 percent. As home prices have increased, the share of high-DTI lending (loans with DTI ≥ 45) has increased across the FICO spectrum.

Share of Loans with LTV ≥ 95

	Ginnie Mae	GSE	All
August 2017- October 2017	70.5%	18.3%	35.7%
August 2019- October 2019	68.9%	16.8%	31.6%

Agency Market Share by DTI and FICO for Loans with LTV ≥ 95

August 2017-October 2017

	FICO					
DTI	<640	640–680	680–700	700–750	≥ 750	All
< 35	2.8%	5.6%	3.2%	8.1%	10.1%	29.8%
35 –45	5.0%	9.8%	5.3%	12.2%	10.6%	42.9%
≥ 45	3.8%	8.0%	3.8%	7.1%	4.7%	27.4%
All	11.6%	23.3%	12.2%	27.5%	25.3%	100.0%

August 2019-October 2019

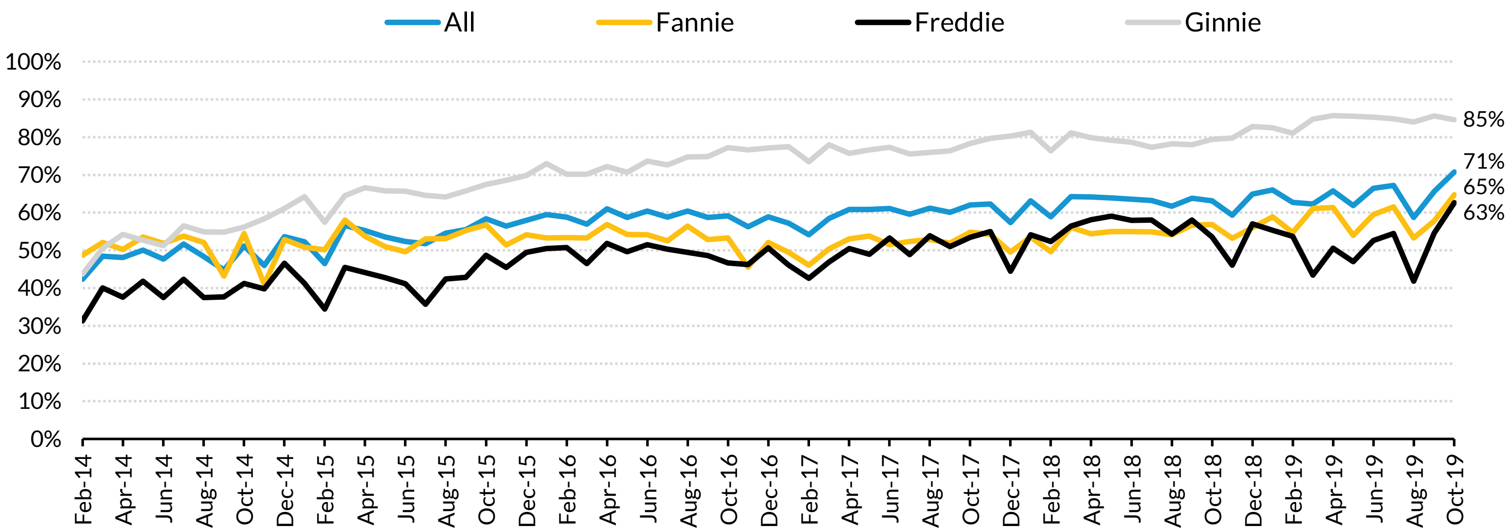
	FICO					
DTI	<640	640–680	680–700	700–750	≥ 750	All
< 35	2.9%	4.8%	2.7%	7.8%	10.7%	28.9%
35 –45	5.0%	8.5%	4.6%	11.6%	10.7%	40.4%
≥ 45	4.4%	7.9%	3.9%	8.2%	6.2%	30.7%
All	12.4%	21.2%	11.2%	27.6%	27.5%	100.0%

Sources: *eMBS and Urban Institute.*

Nonbank Originators

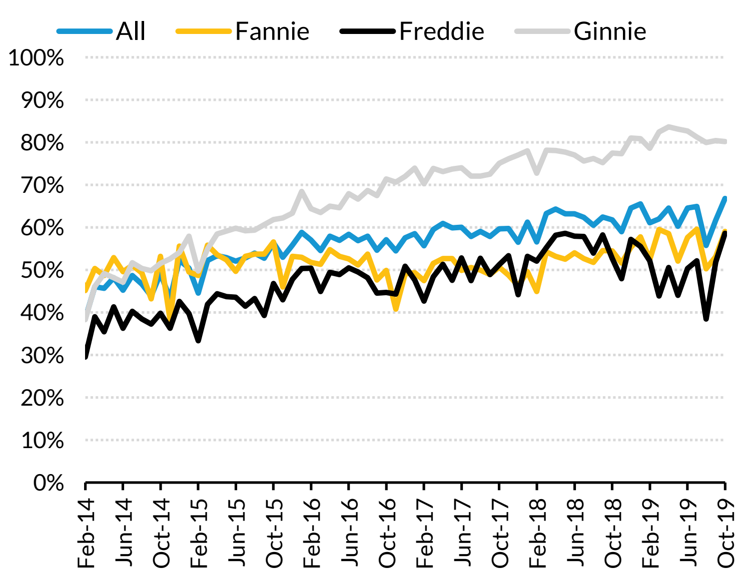
The nonbank origination share has been rising steadily for all three agencies since 2013. The Ginnie Mae nonbank share has been consistently higher than the GSEs, standing at 85 percent in October 2019, just below its record high set in September. Freddie and Fannie's nonbank shares both rose in October, to 65 and 63 percent respectively (note that these numbers can be volatile on a month-to-month basis). Ginnie Mae, Fannie Mae and Freddie Mac all have higher nonbank origination shares for refi activity than for purchase activity. Freddie Mac's nonbank share is the lowest among the three agencies for both purchase and refinance loans.

Nonbank Origination Share: All Loans

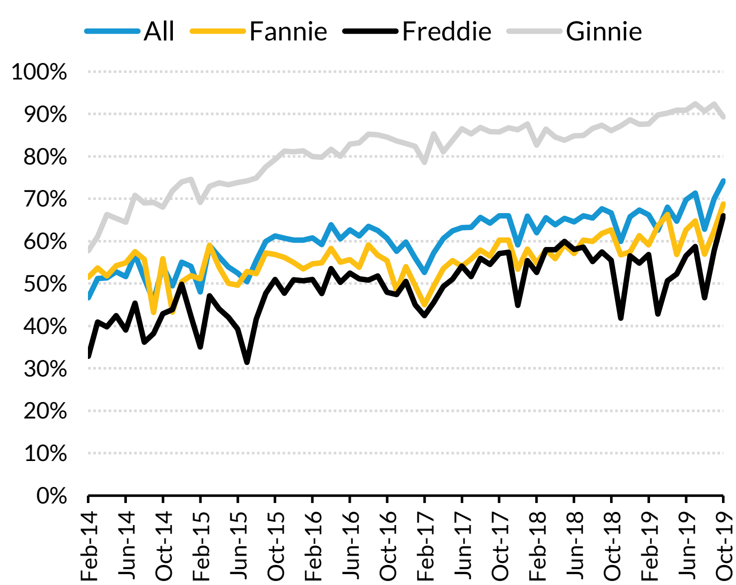


Sources: *eMBS and Urban Institute*
Note: *Data as of September 2019.*

Nonbank Origination Share: Purchase Loans



Nonbank Origination Share: Refinance Loans

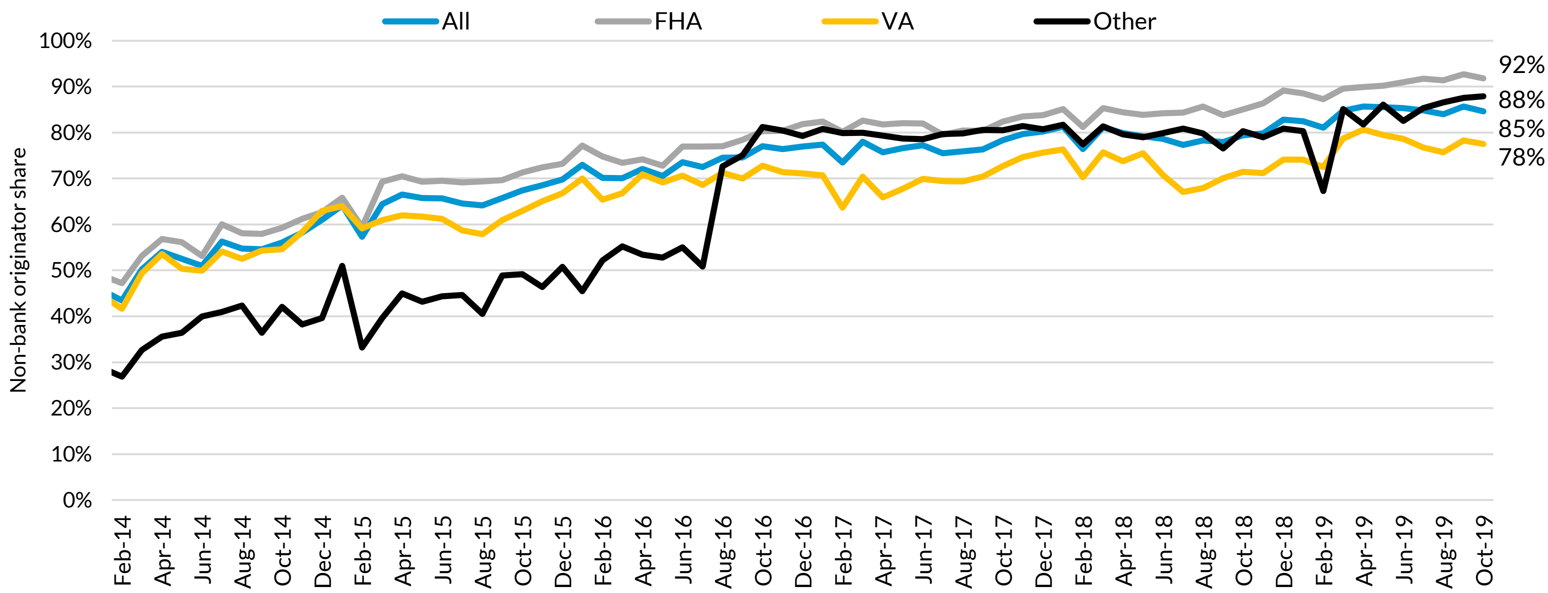


Sources: *eMBS and Urban Institute.* **Note:** *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

Ginnie Mae Nonbank Originators

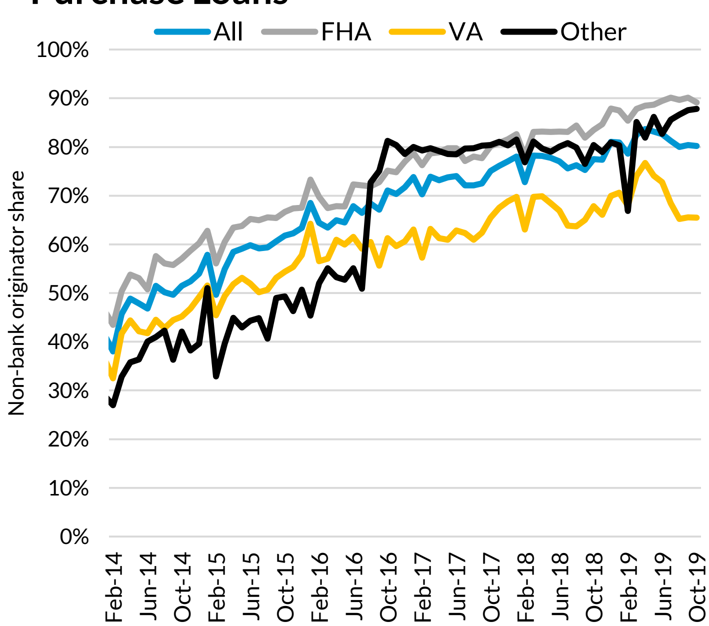
In October 2019, Ginnie Mae's nonbank share grew slightly to 85 percent. The nonbank originator share for FHA fell slightly, down from a historical high last month to 92 percent in October. The nonbank originator share for VA was 78 percent, and the nonbank originator share for other loans, which can fluctuate quite a bit month to month, increased to 88 percent.

Ginnie Mae Nonbank Originator Share: All Loans

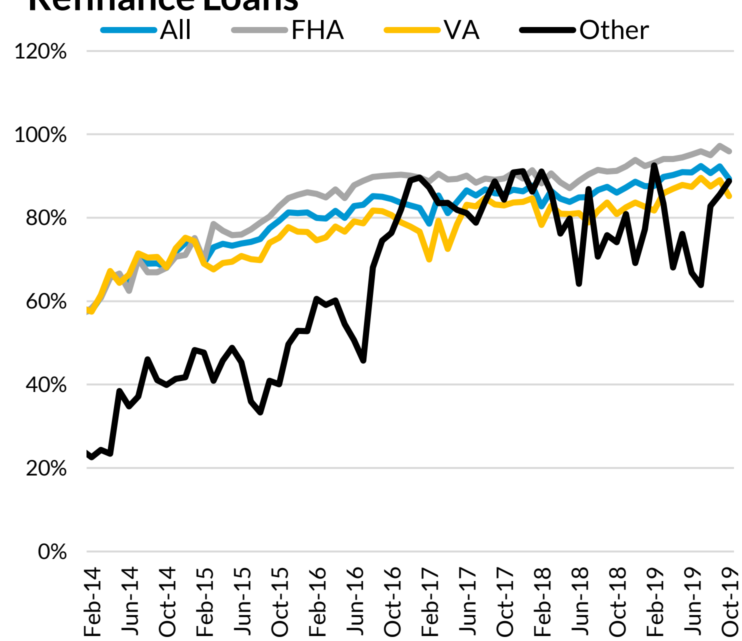


Sources: *eMBS and Urban Institute*
Note: *Data as of October 2019.*

Ginnie Mae Nonbank Share: Purchase Loans



Ginnie Mae Nonbank Share: Refinance Loans

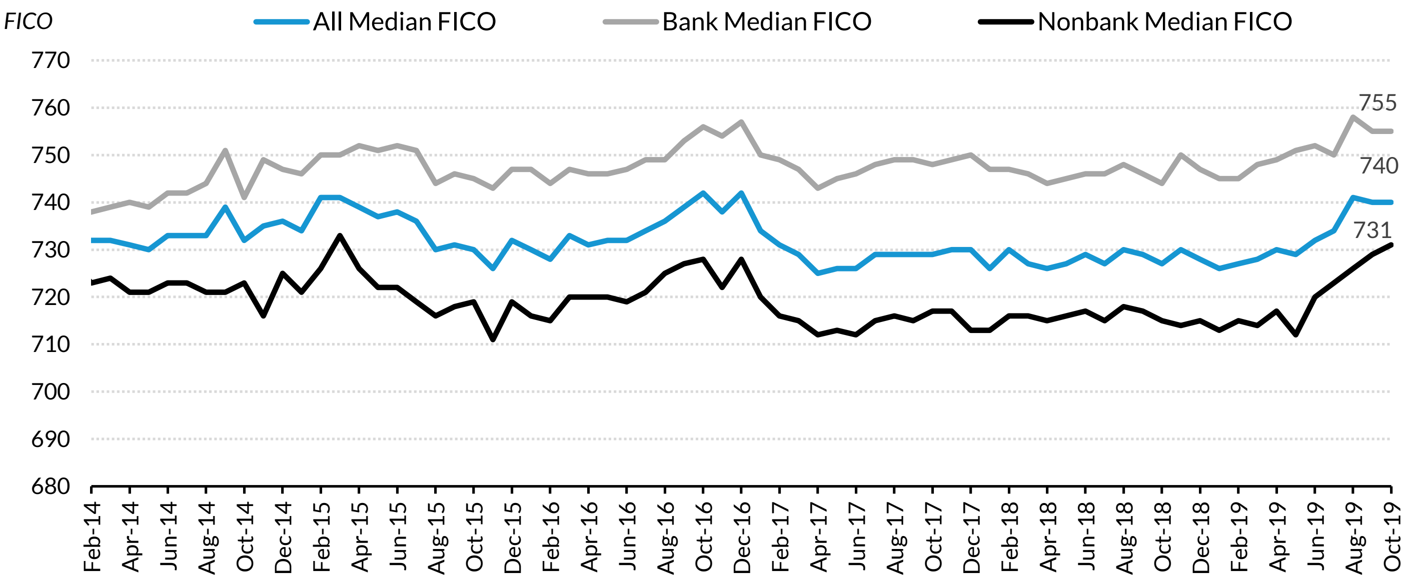


Sources: *eMBS and Urban Institute.* **Note: "***Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

Nonbank Credit Box

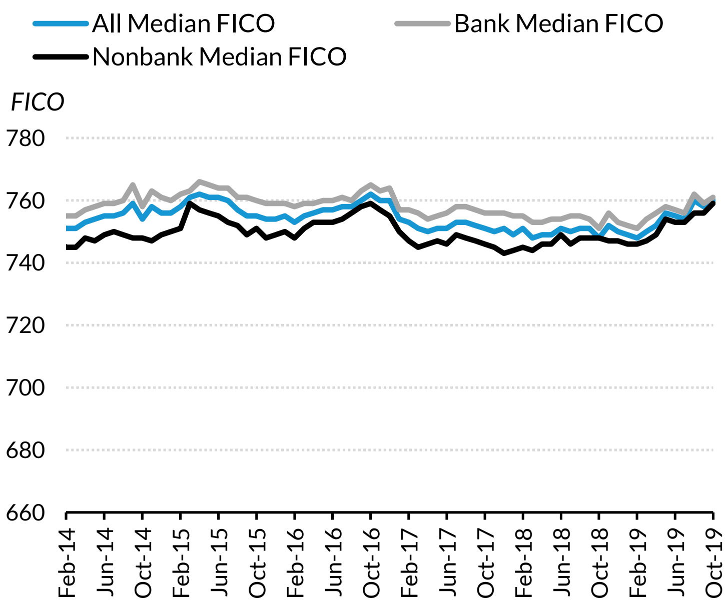
Nonbank originators have played a key role in opening up access to credit. The median GSE and the median Ginnie Mae FICO scores for loans originated by nonbanks are lower than their bank counterparts. Within the GSE space, both bank and nonbank FICOs have increased slightly since 2014. In contrast, within the Ginnie Mae space, FICO scores for bank originations are measurably higher since 2014 while nonbank FICOs have remained flat. This largely reflects the sharp cut-back in FHA lending by many banks.

Agency FICO: Bank vs. Nonbank



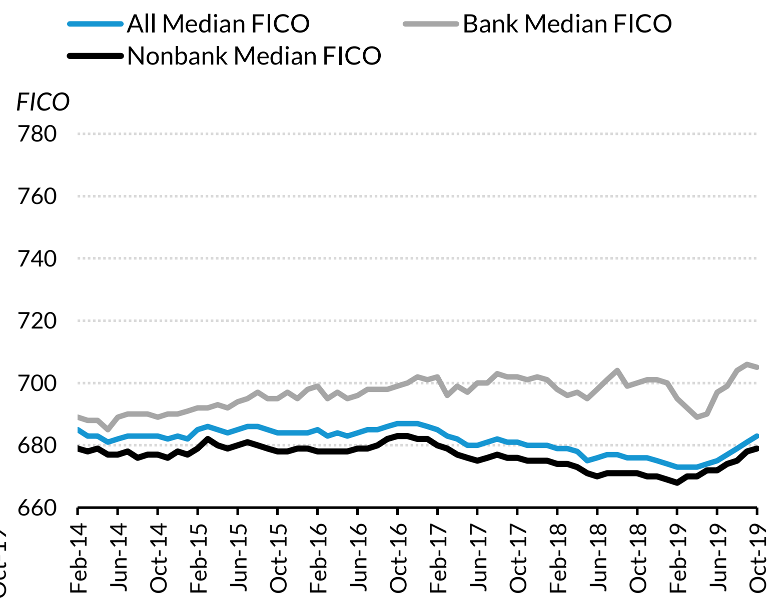
Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2019.*

GSE FICO: Bank vs. Nonbank



Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2019.*

Ginnie Mae FICO: Bank vs. Nonbank

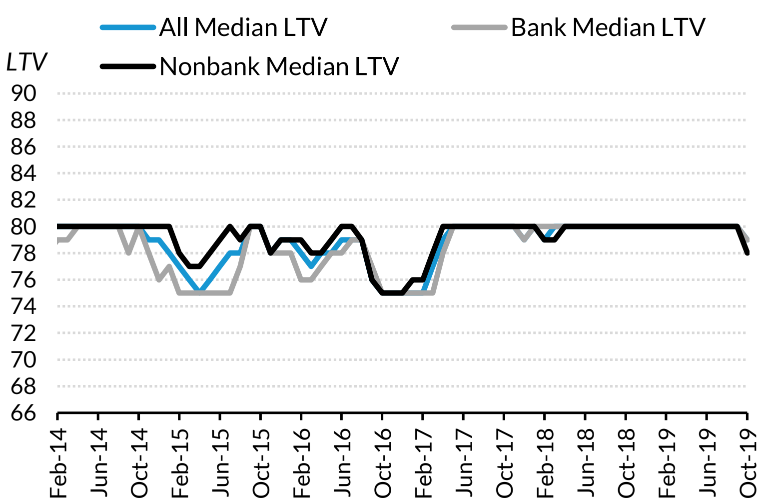


Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2019.*

Nonbank Credit Box

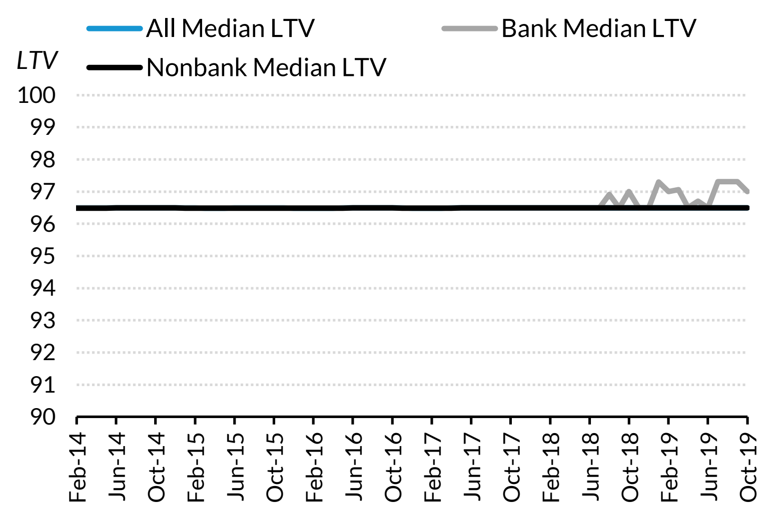
The median LTVs for nonbank and bank originations are comparable, while the median DTI for nonbank loans is higher than for bank loans, indicating that nonbanks are more accommodating in both this and the FICO dimension. Since early 2017, there has been a substantial increase in DTIs, which has partially reversed over the course of 2019. This is true for both Ginnie Mae and the GSEs, for banks and nonbanks. As interest rates increased, DTIs rose, because borrower payments were driven up relative to incomes. With the fall in interest rates in 2019, DTIs have dropped.

GSE LTV: Bank vs. Nonbank



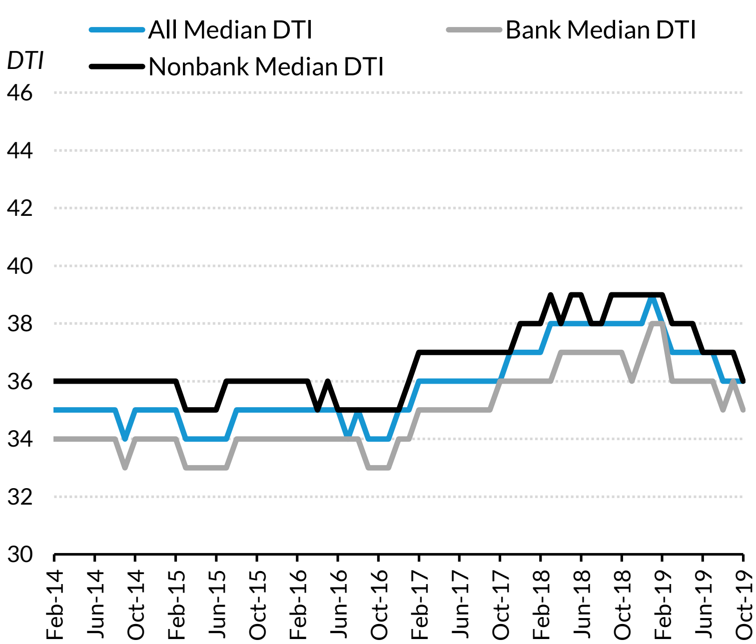
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

Ginnie Mae LTV: Bank vs. Nonbank



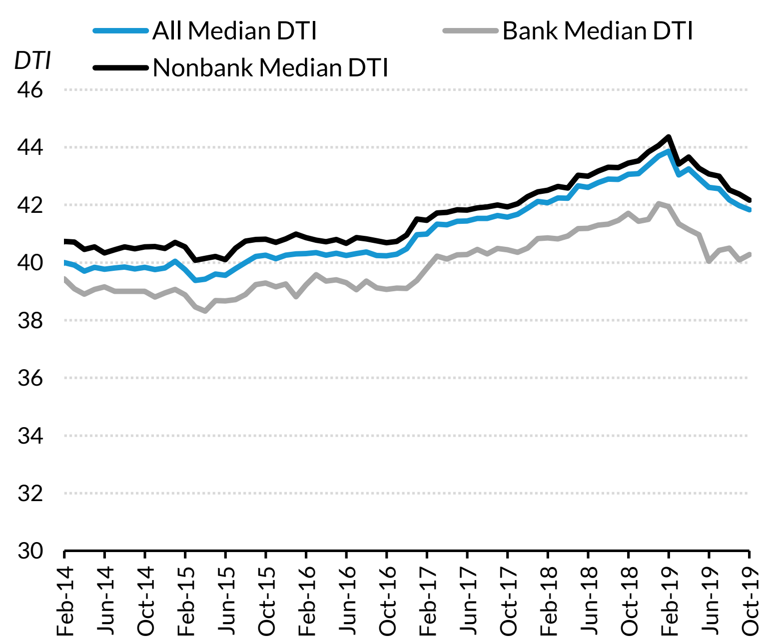
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

GSE DTI: Bank vs. Nonbank



Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

Ginnie Mae DTI: Bank vs. Nonbank

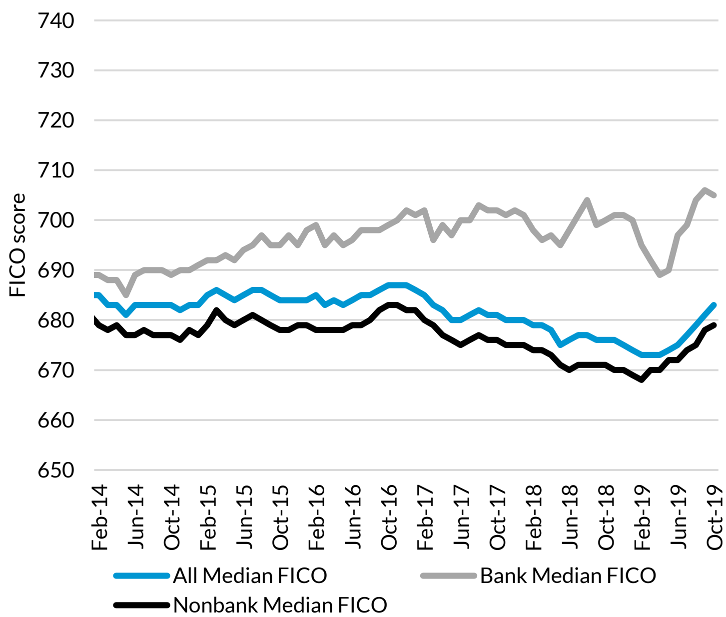


Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2019.*

Ginnie Mae Nonbank Originators: Credit Box

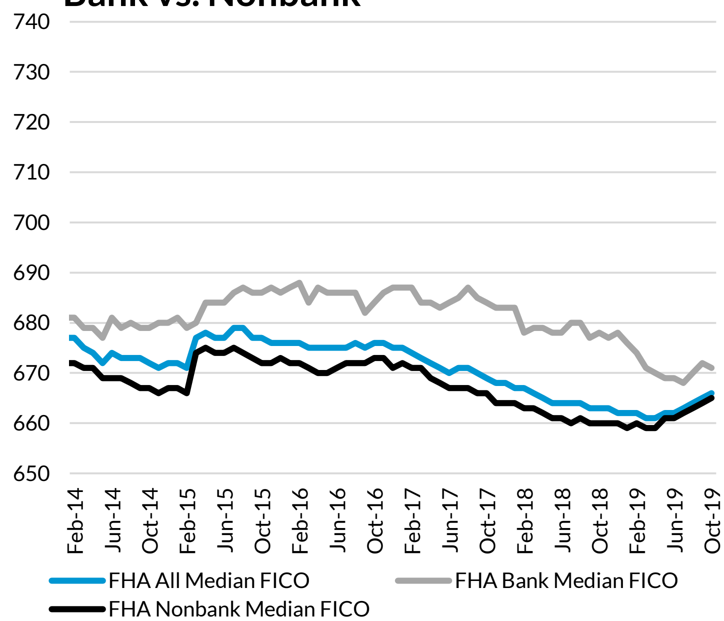
The median FICO score increased for Ginnie Mae nonbank originators and decreased for bank originators in October 2019. FICO spreads between banks and nonbanks have generally increased since 2013. The gap between banks and non-banks is very apparent in all programs backing Ginnie Mae securities: FHA, VA, and Other.

Ginnie Mae FICO Scores: Bank vs. Nonbank



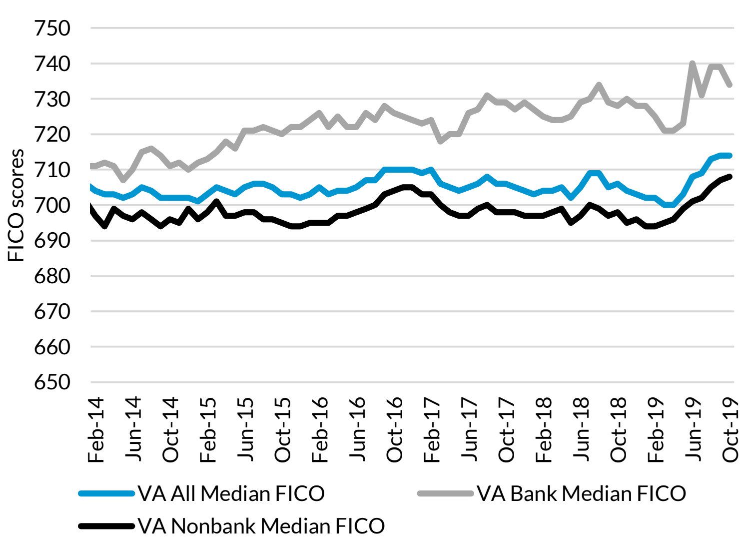
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2019.*

Ginnie Mae FHA FICO Scores: Bank vs. Nonbank



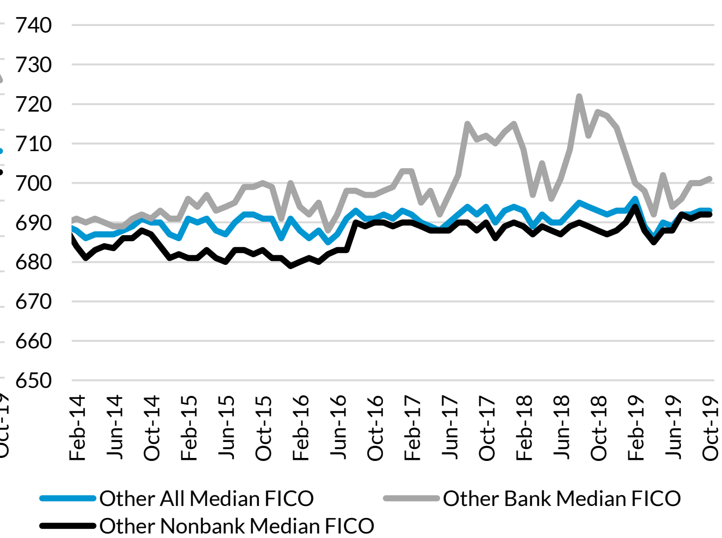
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2019.*

Ginnie Mae VA FICO Scores: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *Data as of October 2019.*

Ginnie Mae Other FICO Scores: Bank vs. Nonbank

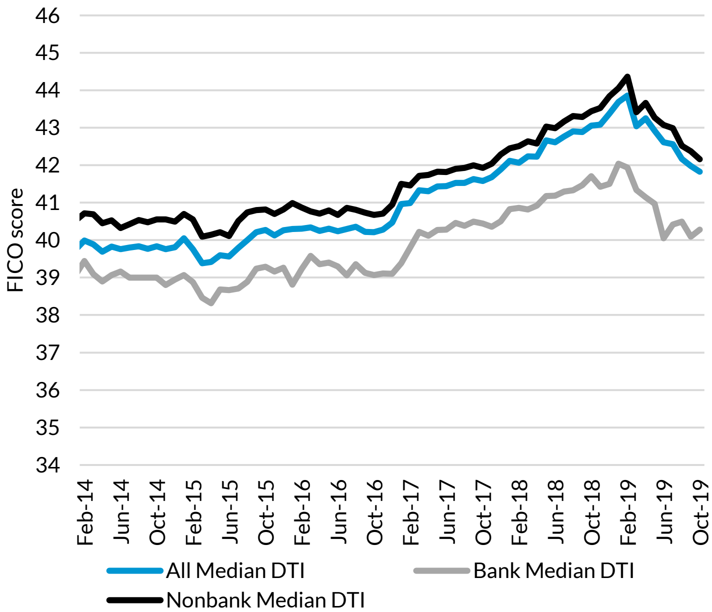


Sources: *eMBS and Urban Institute*
Note: *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

Ginnie Mae Nonbank Originators: Credit Box

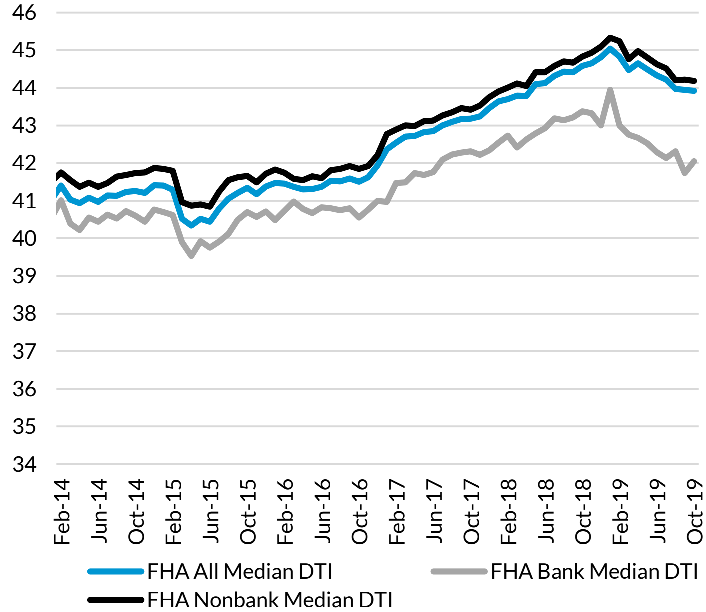
An analysis of borrowers' DTI ratios for bank versus non-bank originators indicates that the former have a lower median DTI. The DTIs for FHA and VA loans experienced notable increases since early 2017 for both bank and nonbank originations, while the Other origination DTIs stayed relatively flat. Rising DTIs are expected in a rising rate environment. After peaking in January 2019, Ginnie DTIs have trended downward, as rates have declined.

Ginnie Mae DTI: Bank vs. Nonbank



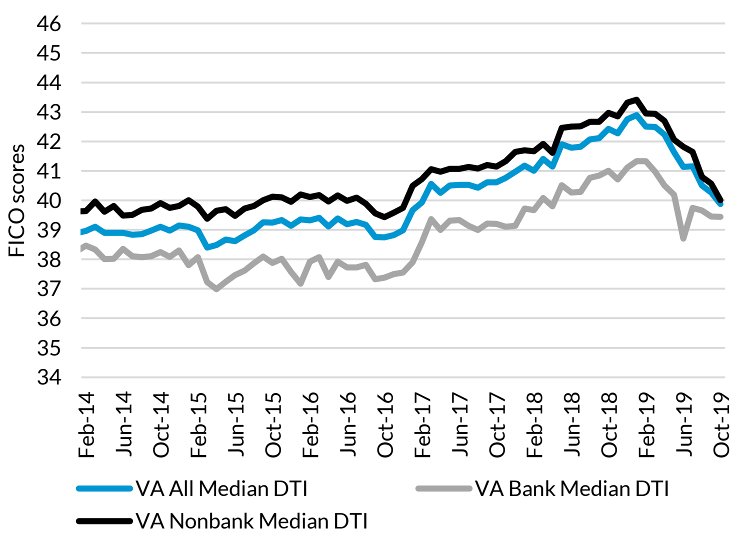
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2019.*

Ginnie Mae FHA DTI: Bank vs. Nonbank



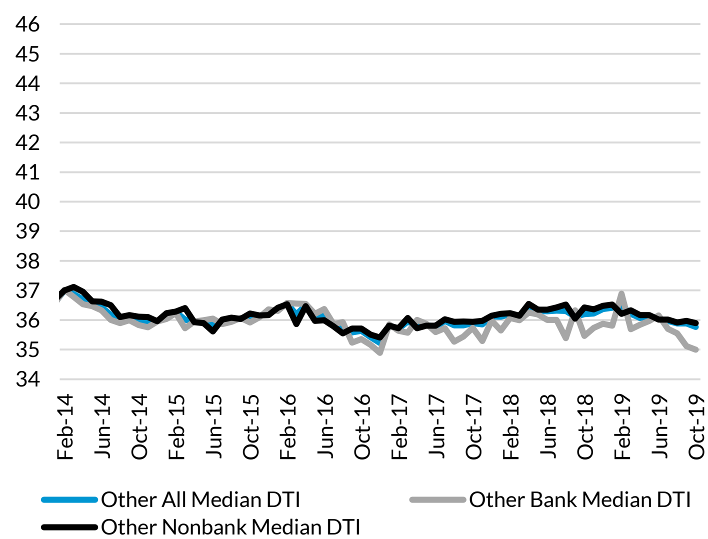
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2019.*

Ginnie Mae VA DTI: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *Data as of October 2019.*

Ginnie Mae Other DTI: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2019.*

Holders of Ginnie Mae MSRs

This table shows 30 largest owners of mortgage servicing rights (MSR) by UPB for Ginnie Mae securitizations. As of October 2019, over half (52.9 percent) of the Ginnie Mae MSRs are owned by the top six firms. The top 30 firms collectively own 85.3 percent. Seventeen of these 30 are non-depositories, the remaining 13 are depository institutions.

Top 30 Holders of Ginnie Mae Mortgage Servicing Rights (MSRs), by UPB

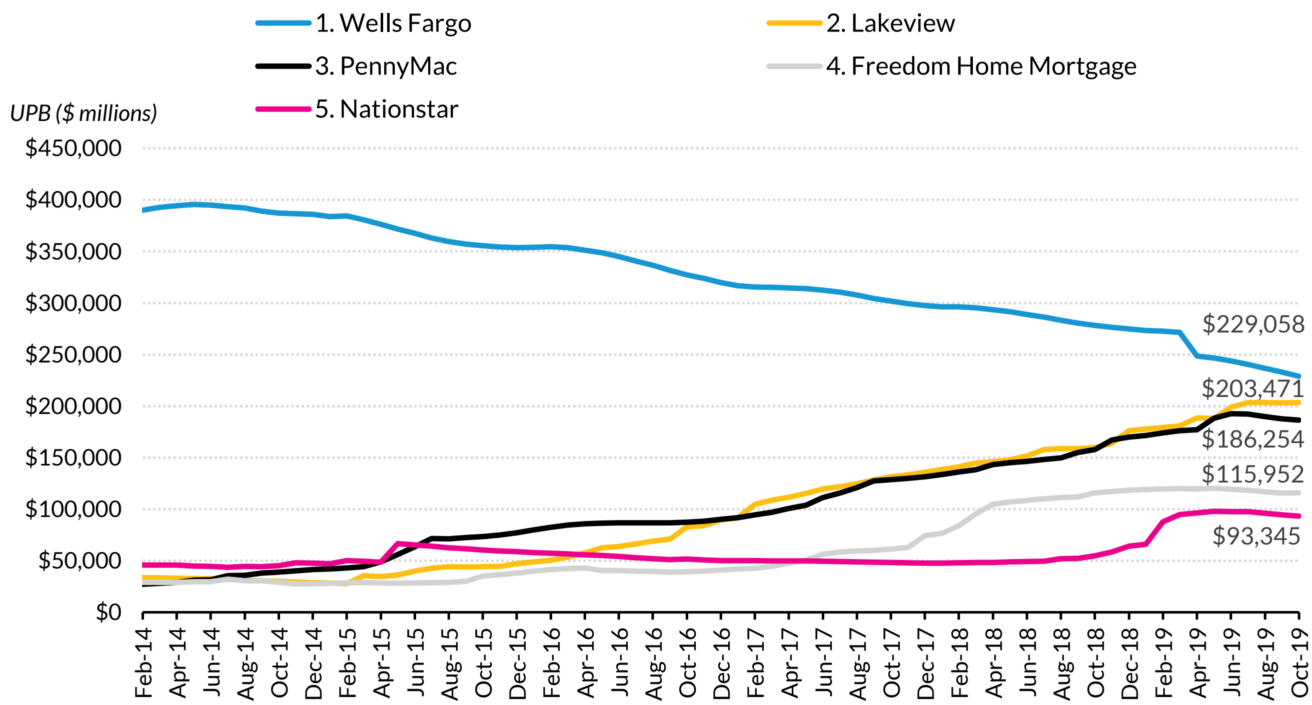
Rank	MSR Holder	UPB ($ millions)	Share	Cumulative Share
1	Wells Fargo	$229,058	13.6%	13.6%
2	Lakeview	$203,471	12.0%	25.6%
3	PennyMac	$186,254	11.0%	36.6%
4	Freedom Home Mortgage	$115,952	6.9%	43.5%
5	Nationstar	$97,684	5.5%	49.0%
6	Quicken Loans	$65,365	3.9%	52.9%
7	US Bank	$58,426	3.5%	56.3%
8	JPMorgan Chase	$42,154	2.5%	58.8%
9	Carrington Home Mortgage	$40,672	2.4%	61.2%
10	USAA Federal Savings Bank	$37,171	2.2%	63.4%
11	Caliber Home Loans	$35,181	2.1%	65.5%
12	Navy Federal Credit Union	$26,391	1.6%	67.1%
13	Newrez	$25,936	1.5%	68.6%
14	Amerihome Mortgage	$25,771	1.5%	70.1%
15	The Money Source	$22,009	1.3%	71.5%
16	Midfirst Bank	$21,413	1.3%	72.7%
17	M&T Bank	$19,293	1.1%	73.9%
18	Roundpoint	$18,000	1.1%	74.9%
19	Suntrust	$17,877	1.1%	76.0%
20	Ditech Financial	$17,790	1.1%	77.0%
21	Home Point Financial	$17,580	1.0%	78.1%
22	Guild Mortgage	$15,393	0.9%	79.0%
23	Branch Banking and Trust	$15,382	0.9%	79.9%
24	Loan Depot	$15,255	0.9%	80.8%
25	PHH Mortgage	$14,078	0.8%	81.6%
26	Flagstar Bank	$13,822	0.8%	82.5%
27	Pingora	$13,175	0.8%	83.2%
28	Citizens Bank	$12,498	0.7%	84.0%
29	Bank of America	$11,179	0.7%	84.6%
30	Fifth Third Bank	$11,108	0.7%	85.3%

Sources: *eMBS and Urban Institute*. **Note:** *Data as of October 2019.*

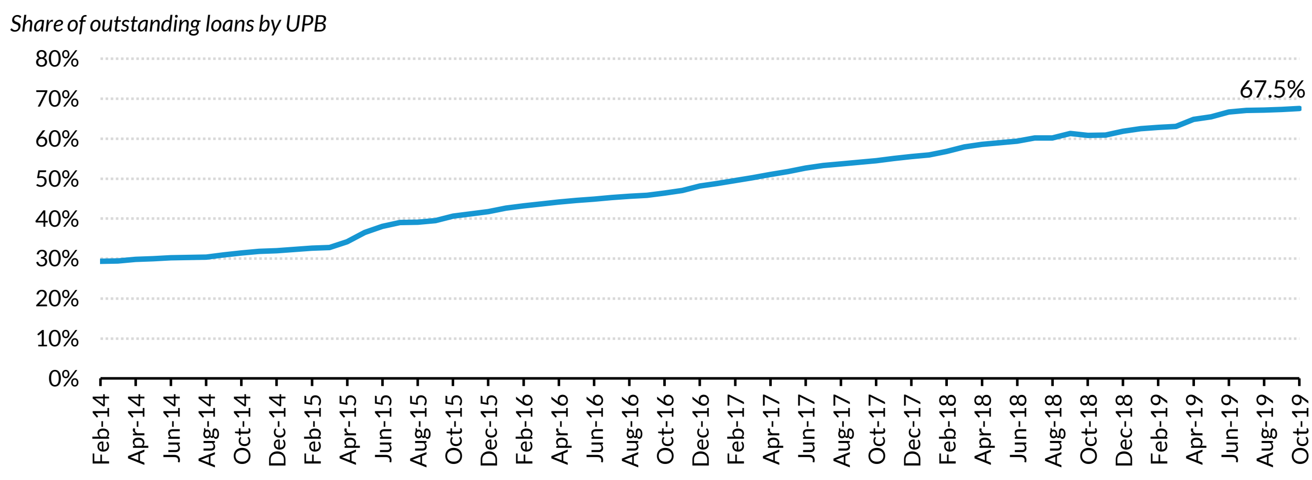
Holders of Ginnie Mae MSRs

The composition of the largest owners of Ginnie Mae MSR has evolved quite a bit over time. In November 2013, Wells Fargo and JP Morgan Chase were the two largest owners of Ginnie Mae MSRs, holding $375 billion and $139 billion in servicing UPB respectively. Although Wells Fargo is still the largest player, its portfolio has shrunk to $229 billion. Lakeview, PennyMac, Freedom Home Mortgage, and Nationstar (all nonbanks) make up the remainder of the top five largest holders of MSRs, owning $203 billion, $186 billion, $116 billion, and $93 billion respectively as of October 2019. As of October 2019, nonbanks collectively owned servicing rights for 67.5 percent of all outstanding unpaid principal balance guaranteed by Ginnie Mae. In December 2013, the nonbank share was much smaller at 27.7 percent.

Top 5 MSR Holders: Outstanding Ginnie Mae Loans by UPB



Share of Ginnie Mae MSRs held by Nonbanks



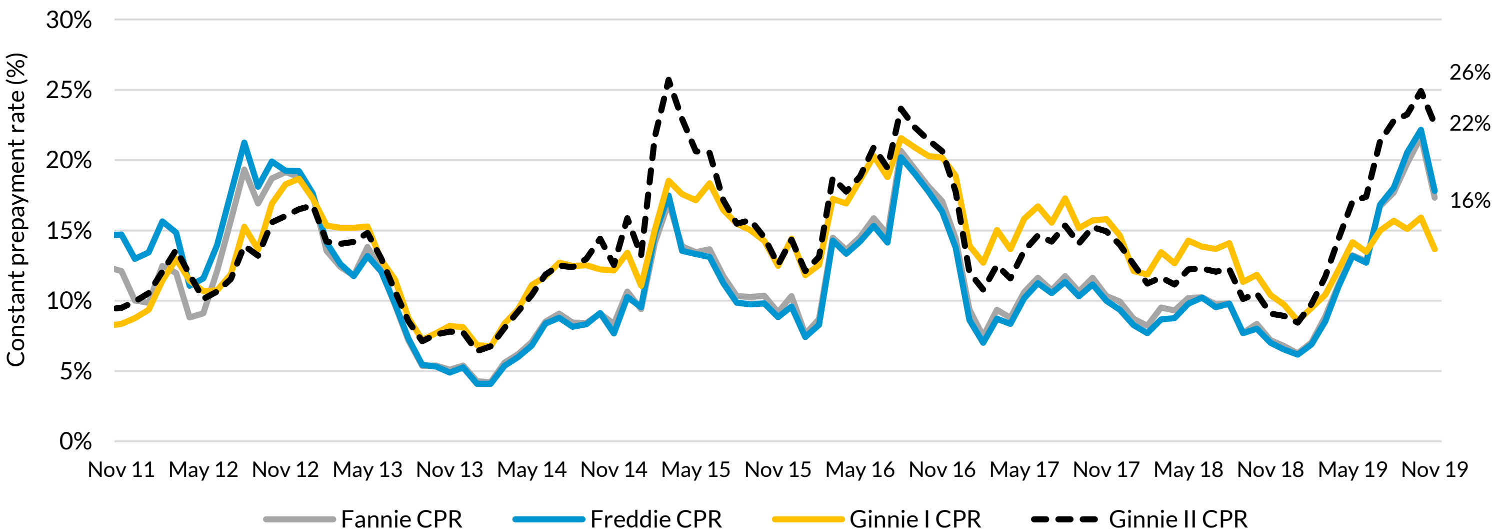
Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2019.*

Prepayments

Prepayments on Ginnie Mae securities were lower than on GSE securities from 2011 through early-2013, but have been higher since. These increased Ginnie speeds reflect the growing share of VA loans, which tend to prepay faster than either FHA or GSE loans. In addition, FHA puts fewer restrictions on streamlined refinances, and unlike GSE streamline refinances, requires no credit report and no appraisal. Some of the upfront mortgage insurance premium can also be applied to the refinanced loan.

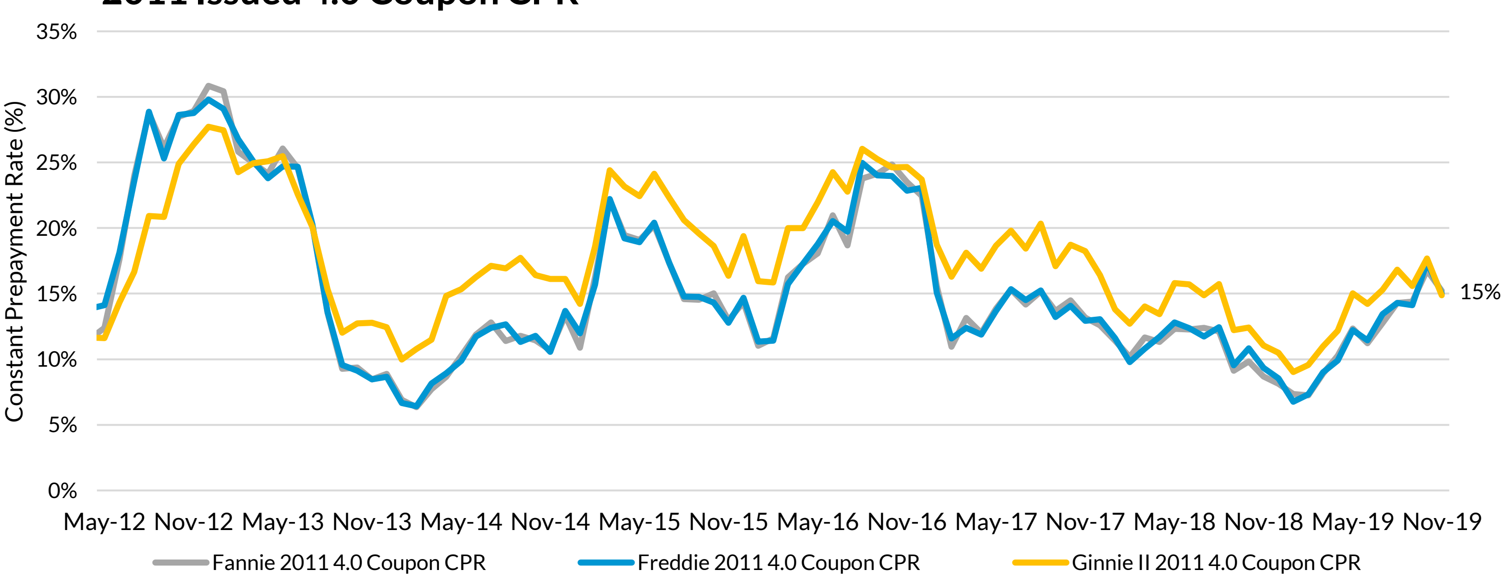
From late 2016 to later 2018, as interest rates increased, the bulk of the mortgage universe found it non-economic to refinance and the prepayment speeds for all agency MBS slowed substantially. The small month-to-month variation in speeds reflected primarily seasonality and changes in day count. With the drop in rates beginning in late 2018 and persisting through 2019, we have seen a notable pick up in prepayment activity. This activity level is rate dependent; If rates drop further, speeds are likely to increase. However, the seasonal patterns suggest, in the absence of rate movements, a slightly decrease in speeds in the months ahead.

Aggregate Prepayments



Sources: *Credit Suisse and Urban Institute*. **Note:** *Data as of November 2019.*

2011 Issued 4.0 Coupon CPR



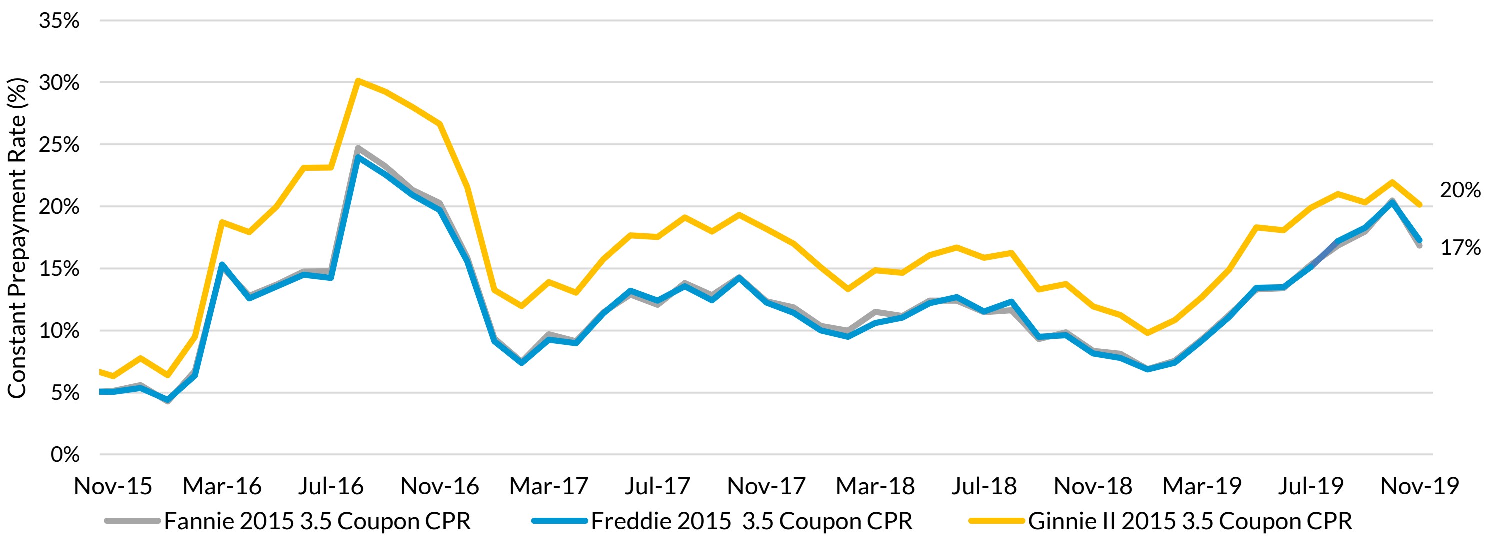
Sources: *Credit Suisse and Urban Institute*. **Note:** *Data as of November 2019.*

Prepayments

The 2015 Ginnie II 3.5s and the 2016 Ginnie II 3.0s, the largest coupon cohorts of those vintage years, have prepaid consistently faster than their conventional counterparts. 2015 and 2016 originations are more heavily VA loans than the 2011 origination shown on the preceding page. VA loans prepay faster than either FHA or GSE loans. The FHA streamlined programs are likely another contributor to the faster speeds.

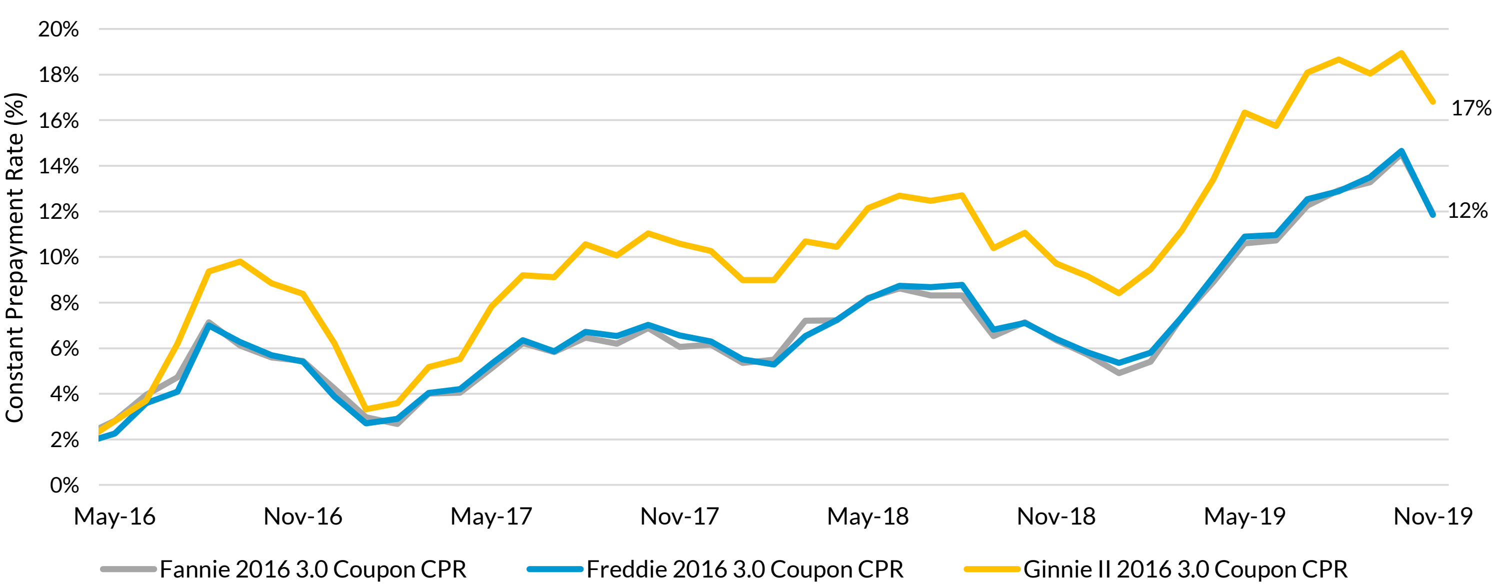
With the increase in interest rates over the 2 year period beginning in November 2016, the prepayment speeds for all agency MBS had slowed. From late 2016 to late 2018, with the bulk of the mortgage universe finding it non-economic to refinance, the muted month to month variations in speeds reflected seasonality, changes in day count and changes in mortgage interest rates. With the drop in rates beginning in late 2018 and persisting through 2019, we have seen a notable pick up in prepayment activity. This activity level is rate dependent; If rates drop further, speeds are likely to increase. However, the seasonal patterns suggest, in the absence of rate movements, a slightly decrease in speeds in the months ahead.

2015 Issued 3.5 Coupon CPR



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2019.*

2016 Issued 3.0 Coupon CPR

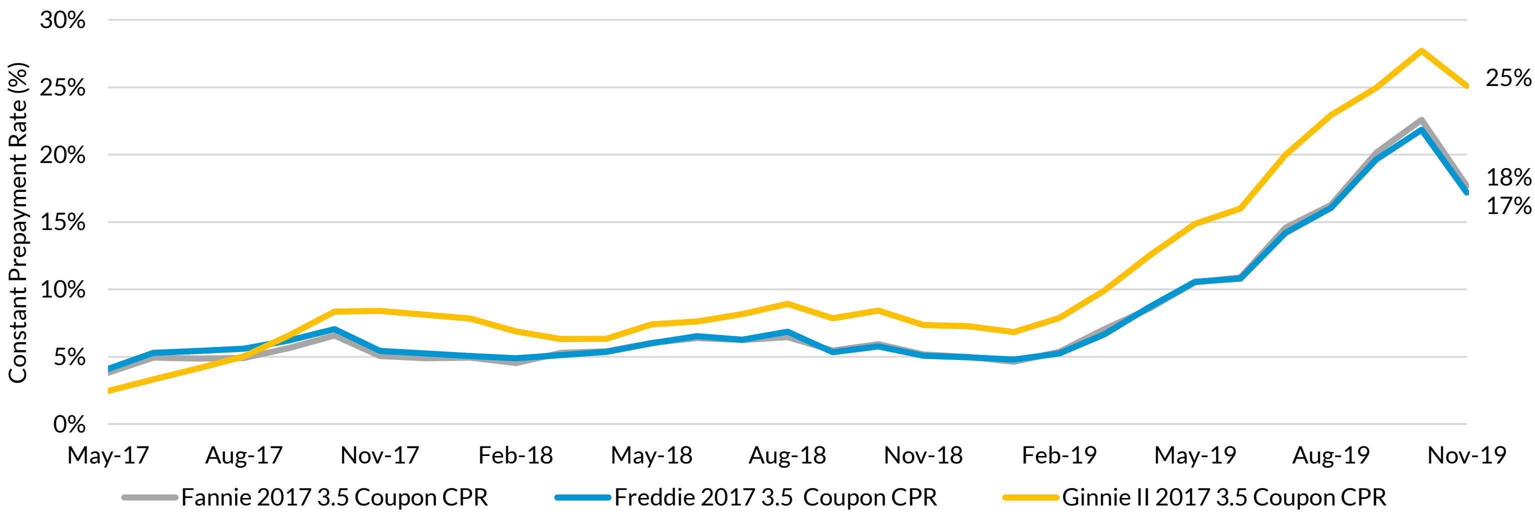


Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2019.*

Prepayments

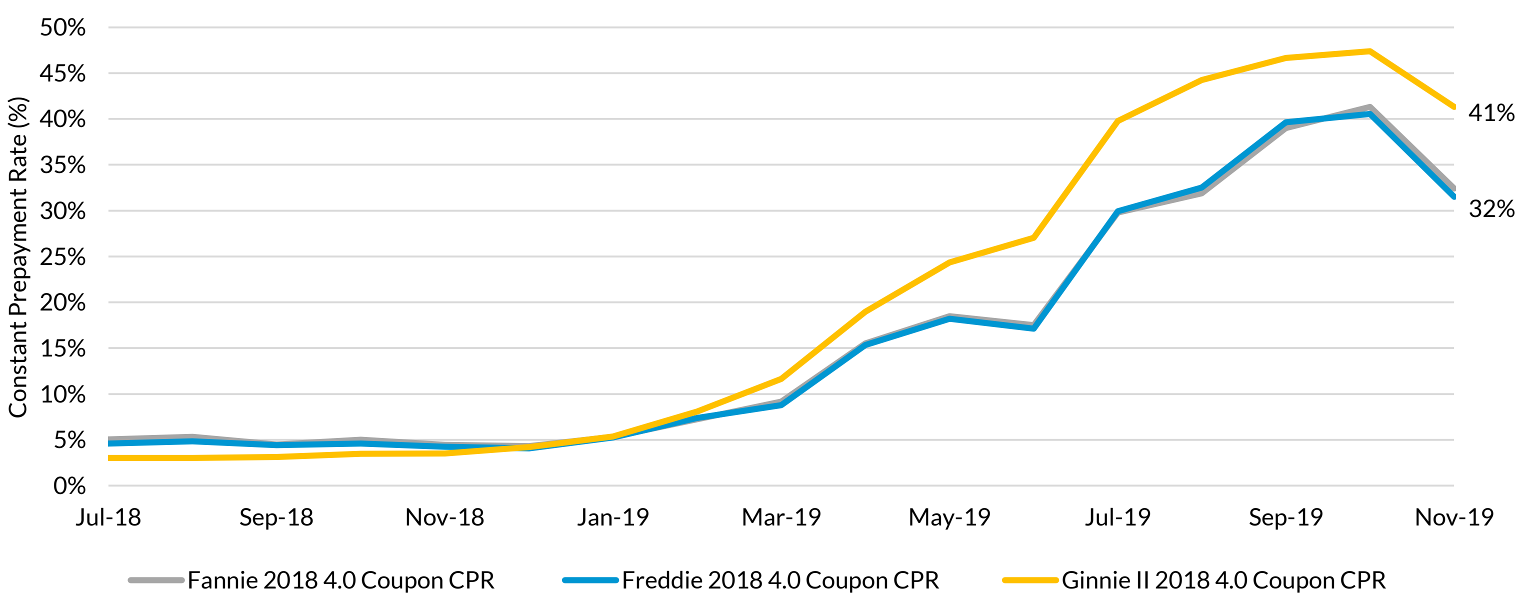
Ginnie Mae securities season more slowly than their conventional counterparts; they generally have lower prepayment in the early months but are more interest rate responsive thereafter. The charts below show the behavior of the 2017-issued 3.5s and the 2018-issued 4.0s, the largest coupon cohorts of those vintage years. Despite slower seasoning, 2017 Ginnie II 3.5s have been prepaying faster than their conventional counterparts since late 2017, due primarily to fast VA prepayment speeds. Similarly, the 2018 Ginnie II 4.0s prepaid more slowly than their conventional counterparts until January of 2019. In 2019, speeds of all 2018 4.0s have accelerated, and Ginnie II speeds have accelerated more than their conventional counterparts.

2017 Issued 3.5 Coupon CPR



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2019.*

2018 Issued 4.0 Coupon CPR

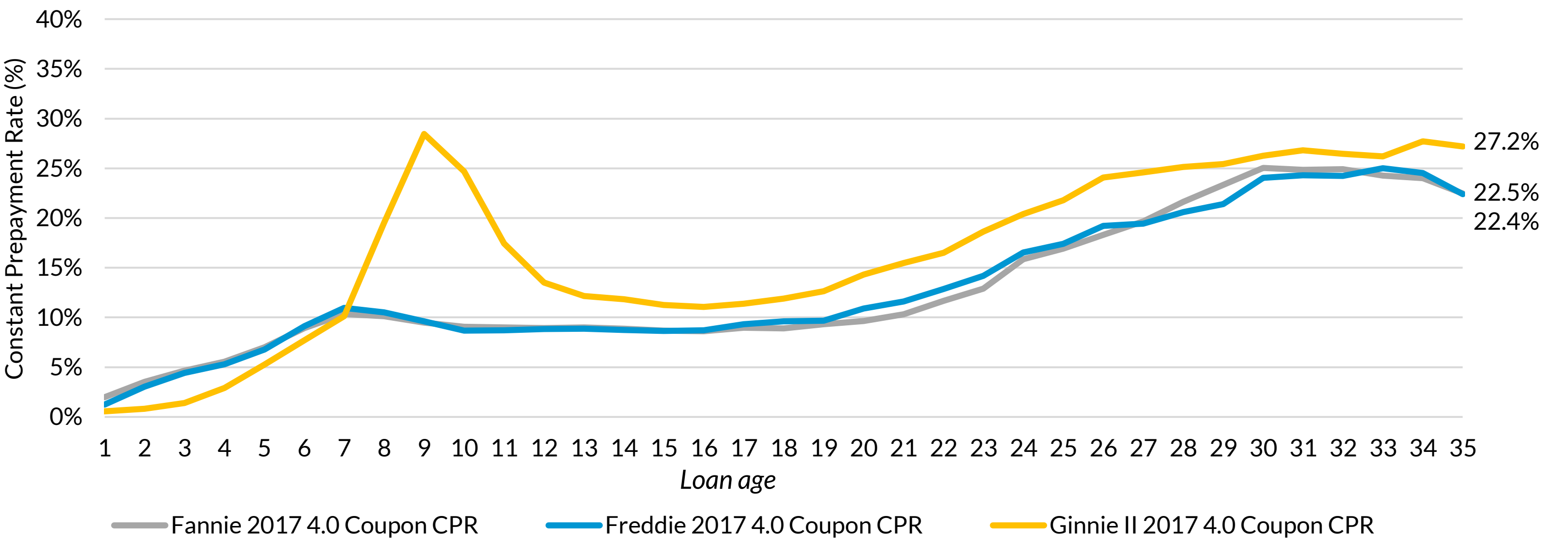


Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2019.*

Prepayments

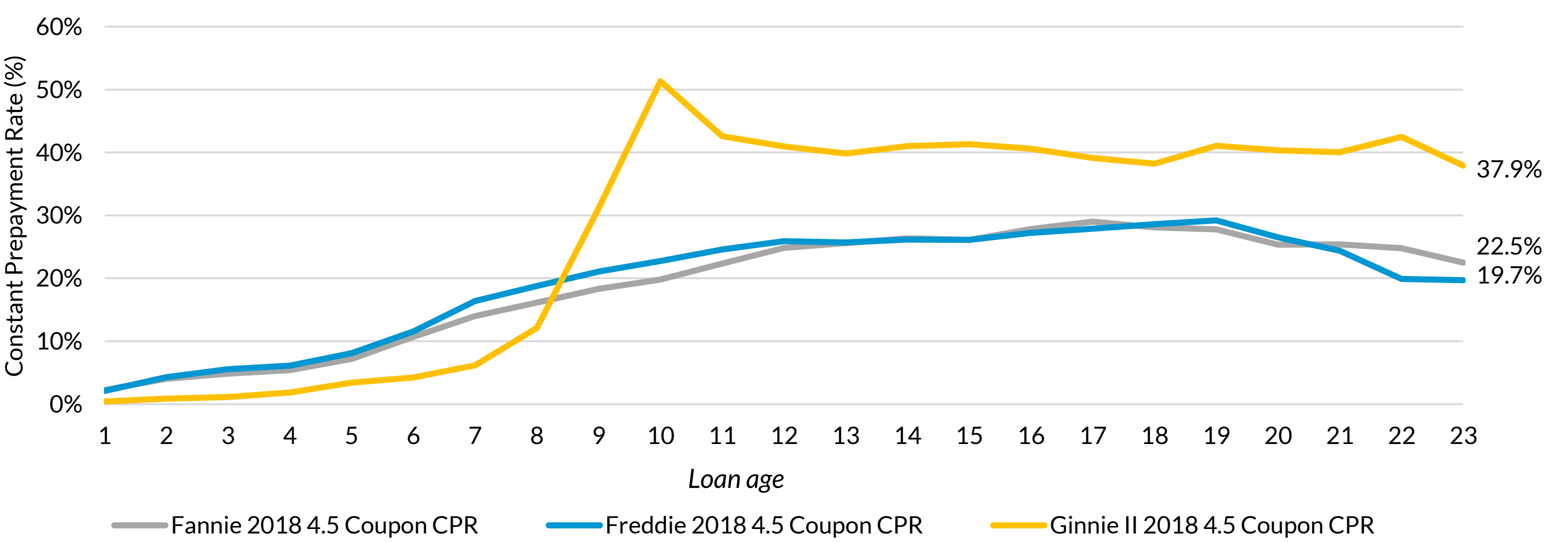
The charts below show the prepayment speeds by loan age for 2017 Ginnie II 4.0s and 2018 Ginnie II 4.5s—the cohorts 50 basis points above the largest coupon cohort for those years. Prepayment speeds on the 2017 Ginnie II 4.0s jumped up sharply at the 7-9 month loan age, reflecting abuse of the VA Streamlined Refi program (IRRRL). The 2018 Ginnie II 4.5s do not show increased speeds until the 9-10 month point; reflecting both the effect of lower rates and the actions taken by both Ginnie Mae and the VA in H1 2018 to curb this abuse. Ginnie Mae actions have included suspending a few servicers whose VA prepayment speeds are especially high from selling VA loans into Ginnie Mae II securities, as well as rewriting the pooling requirements so that if loans that do not meet the seasoning requirement are refinanced, the new loan is ineligible for securitization. Ginnie's latest action on this front became effective for securities issued on or after Nov 1 2019. It bars the securitization of over 90% LTV cash-out refinances into Ginnie I and Ginnie II pools (custom pools excepted). In addition, VA has implemented a net tangible benefit test, requiring the lender to show the borrower has obtained a benefit from the refinance. Even so, the recent experience of the 2018 Ginnie II 4.5s indicates they are much more responsive to interest rate changes than conventional mortgages.

2017 Issued 4.0 Coupon CPR, by Loan Age



Sources: *Credit Suisse and Urban Institute*. **Note:** *Data as of November 2019.*

2018 Issued 4.5 Coupon CPR, by Loan Age

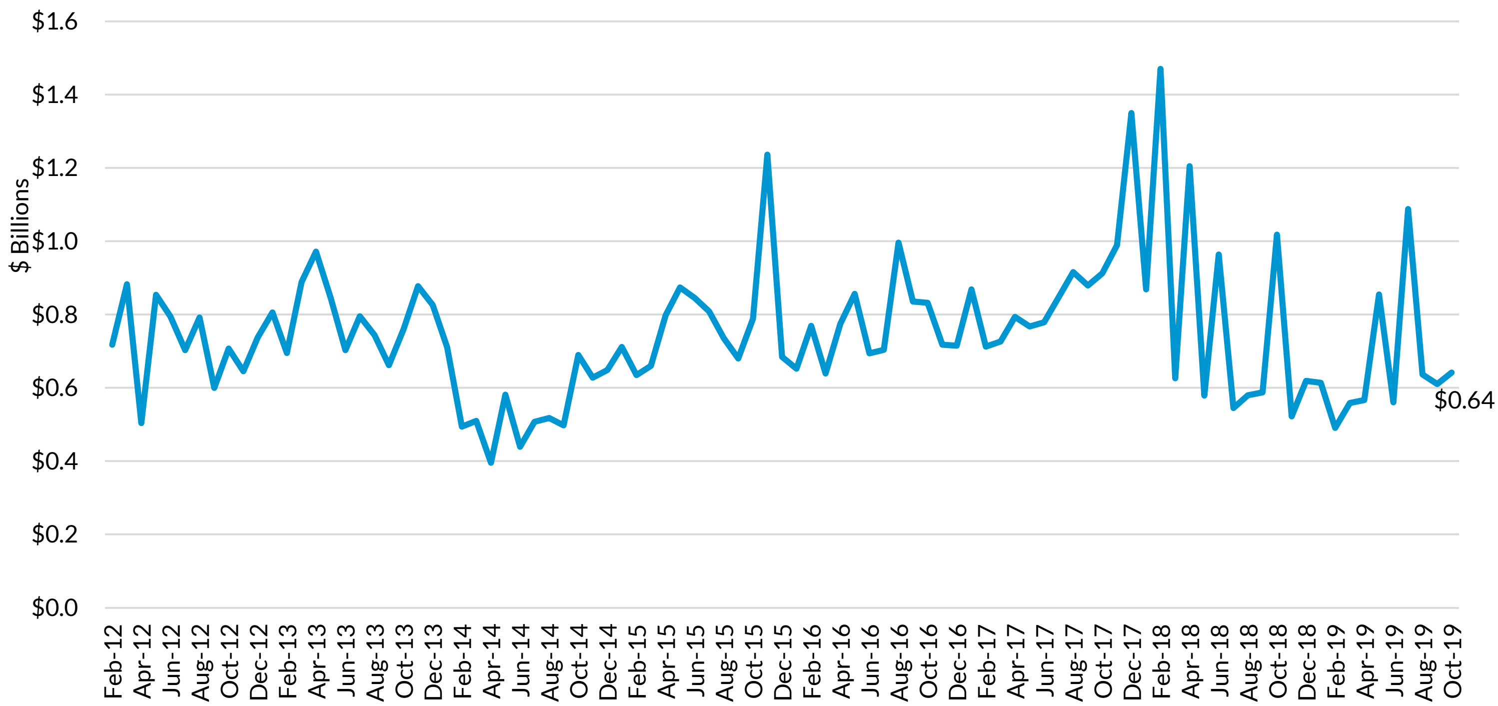


Sources: *Credit Suisse and Urban Institute*. **Note:** *Data as of November 2019.*

Other Ginnie Mae Programs Reverse Mortgage Volumes

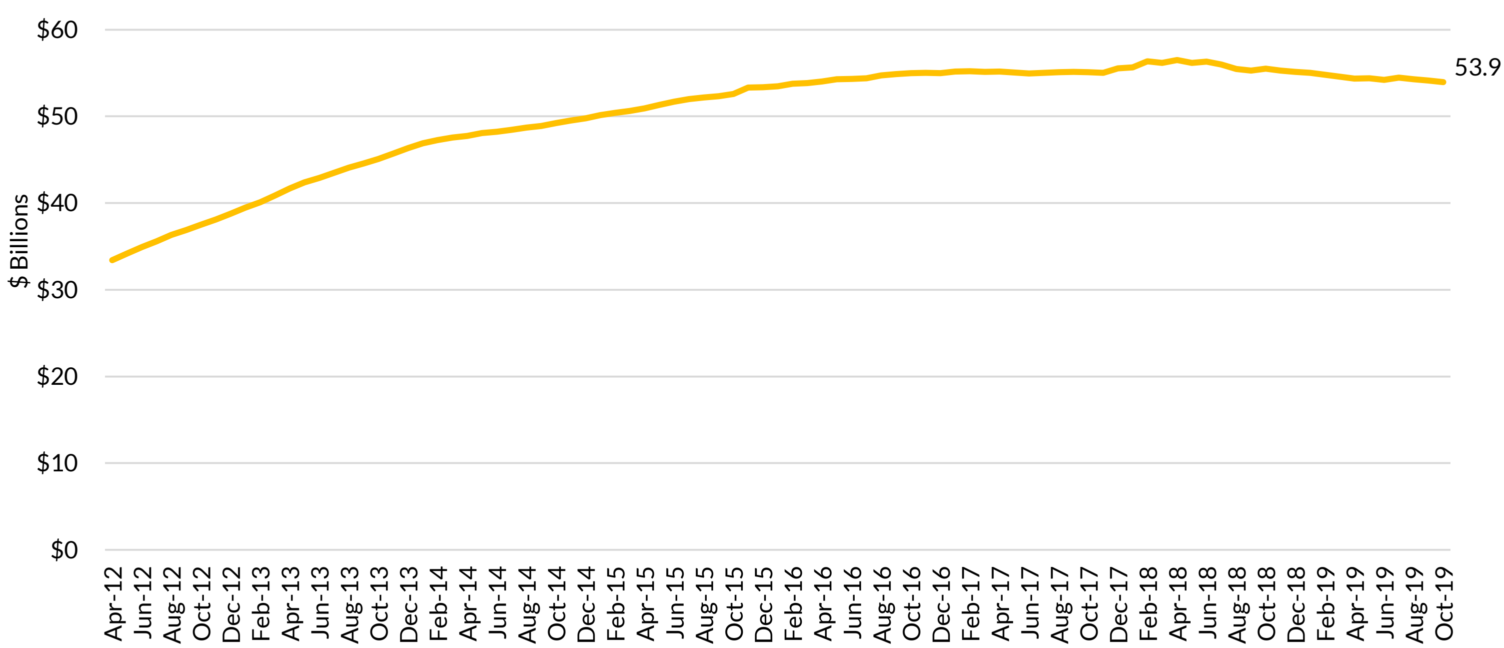
Ginnie Mae reverse mortgage issuance has been volatile in recent months; after increasing in July, volume fell consecutively in August and September 2019 but rose in October to $0.64 billion. Issuance has been declining since early 2018 largely due to the implementation of the new, lower principal limit factors. In October 2019, outstanding reverse mortgage securities totaled $53.9 billion, lower compared to recent past, reflecting a lower volume of new issuances.

HMBS Issuance Volume



Sources: *Ginnie Mae and Urban Institute.* ***Note:*** *Data as of October 2019.*

HMBS Outstanding

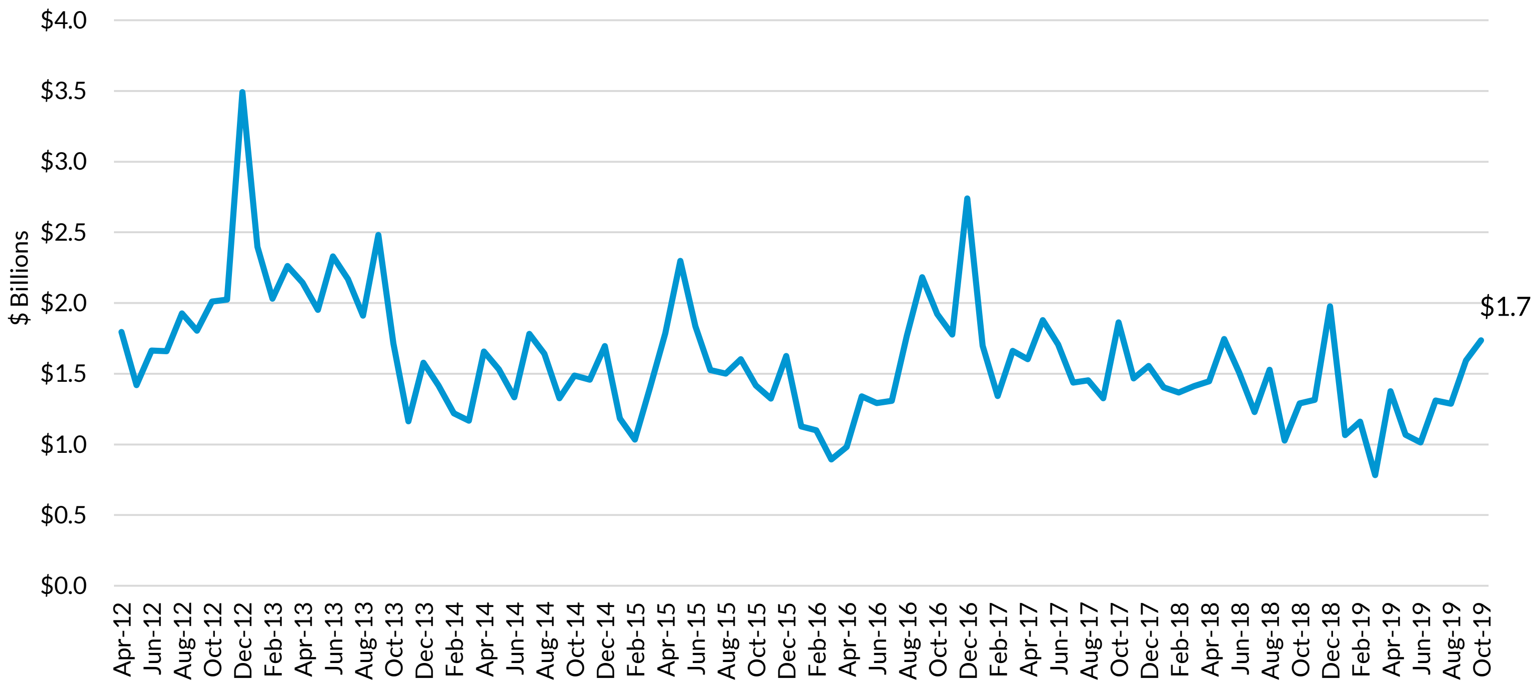


Sources: *Ginnie Mae and Urban Institute.* ***Note:*** *Data as of October 2019.*

Other Ginnie Mae Programs Multifamily Market

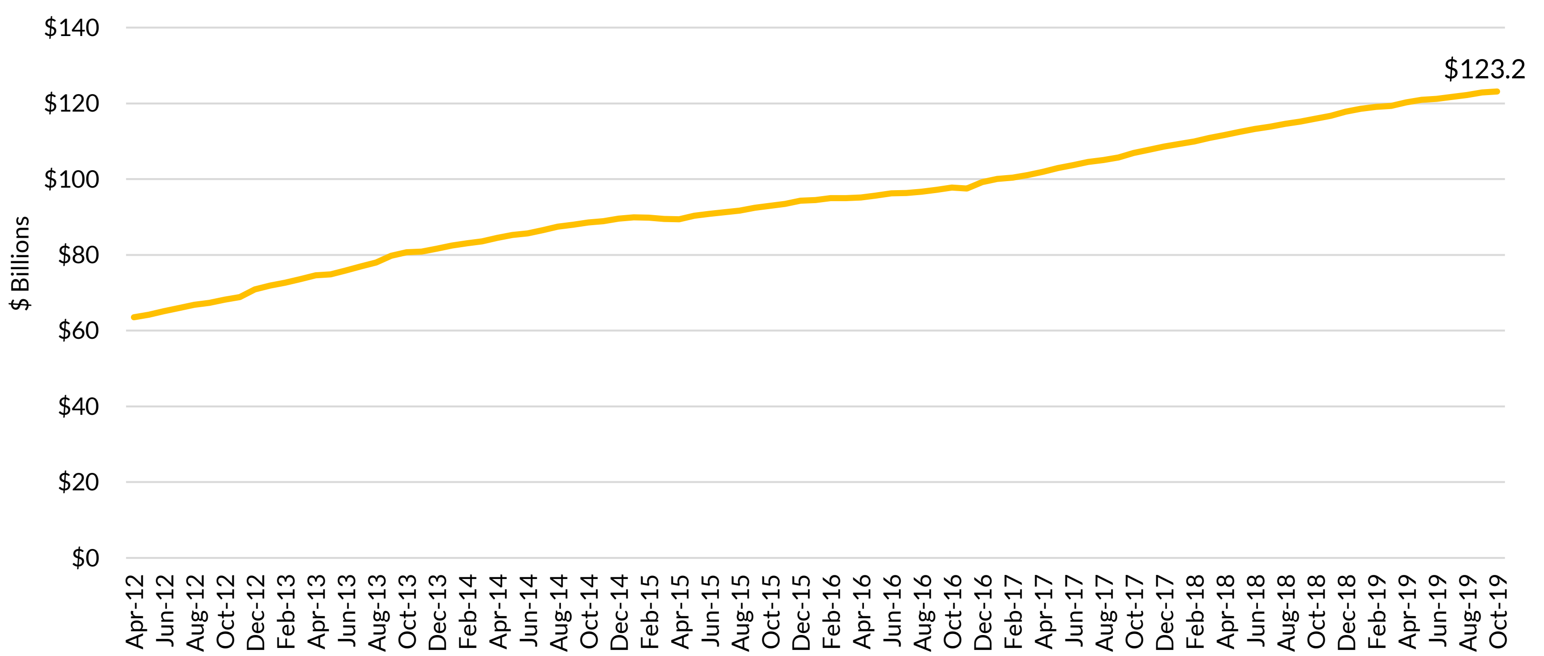
Ginnie Mae multifamily issuance volume in October 2019 totaled $1.7 billion, an increase from the past month but below average issuance levels over the past 18 months. Outstanding multifamily securities totaled $123.2 billion in October.

Ginnie Mae Multifamily MBS Issuance



Sources: *Ginnie Mae and Urban Institute.* ***Note****: Data as of October 2019.*

Ginnie Mae Multifamily MBS Outstanding

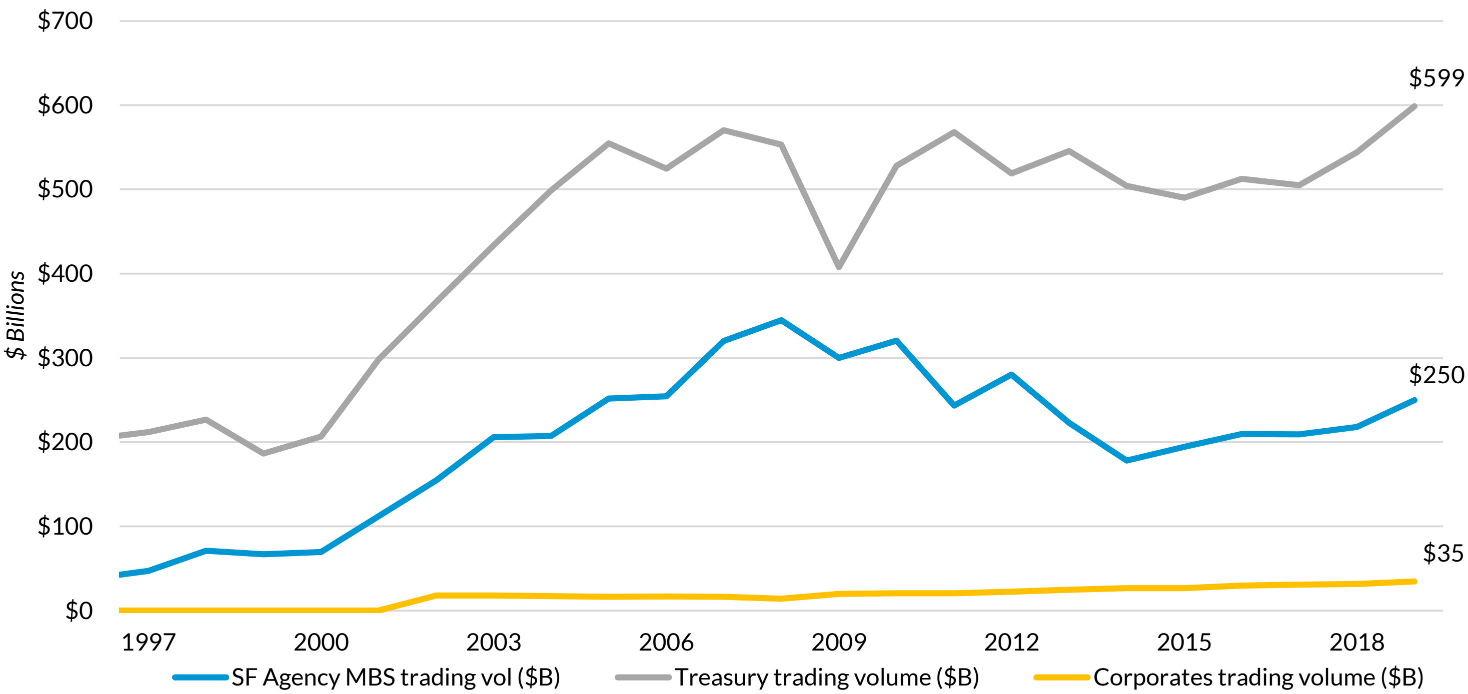


Sources: *Ginnie Mae and Urban Institute.* ***Note****: Data as of October 2019.*

Market Conditions

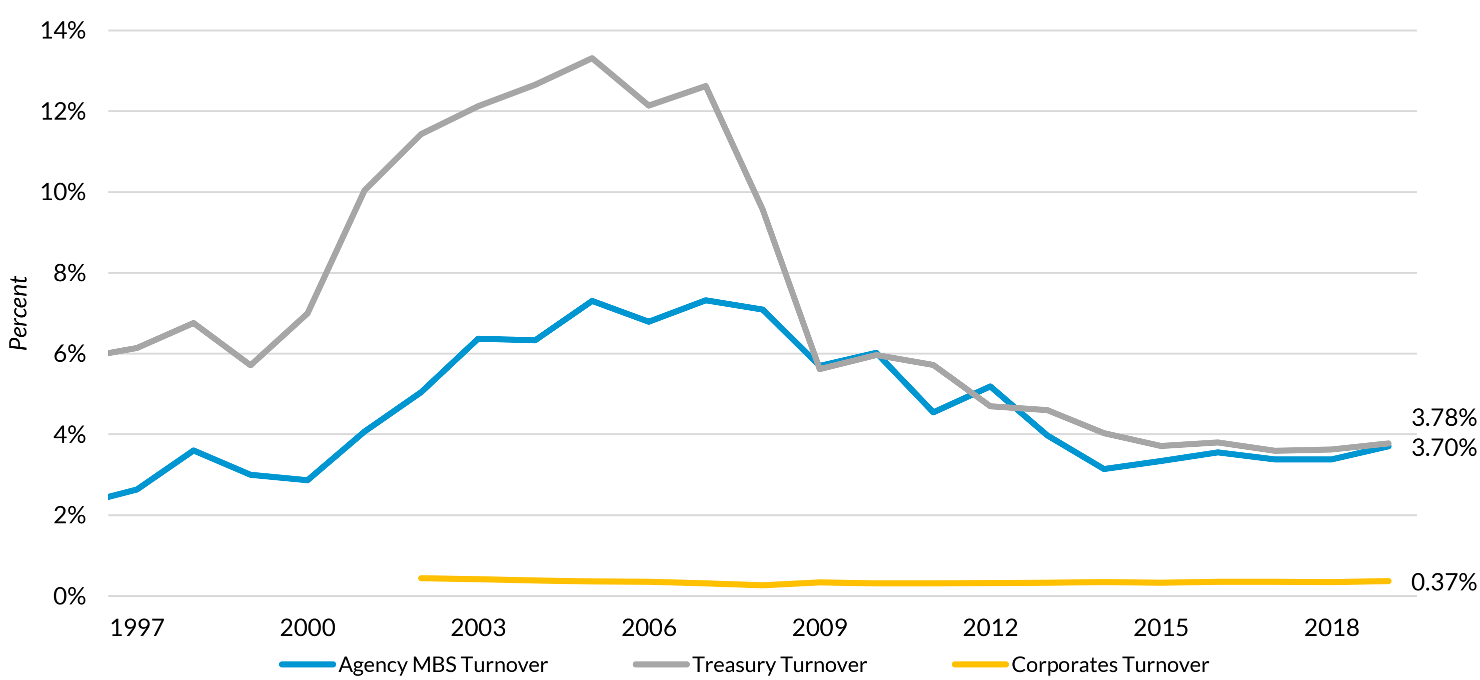
Agency MBS trading volume was $250 billion/day on average 2019 YTD, more robust than in the 2014-2018 period, but well below the pre-crisis peak of $345 billion in 2008. In contrast, average daily trading volume for Treasuries now exceeds the pre-crisis peak. Agency MBS turnover in 2019 YTD also has been slightly higher than the 2014-2018 period; in the first eleven months of 2019, average daily MBS turnover was 3.70 percent, above the 2018 average of 3.39 percent. Both average daily mortgage and Treasury turnover are down from their pre-crisis peaks. Corporate turnover is miniscule relative to either Agency MBS or Treasury turnover.

Average Daily Fixed Income Trading Volume by Sector



Sources: *SIFMA and Urban Institute.* ***Note:*** *Data as of November 2019.*

Average Daily Turnover by Sector

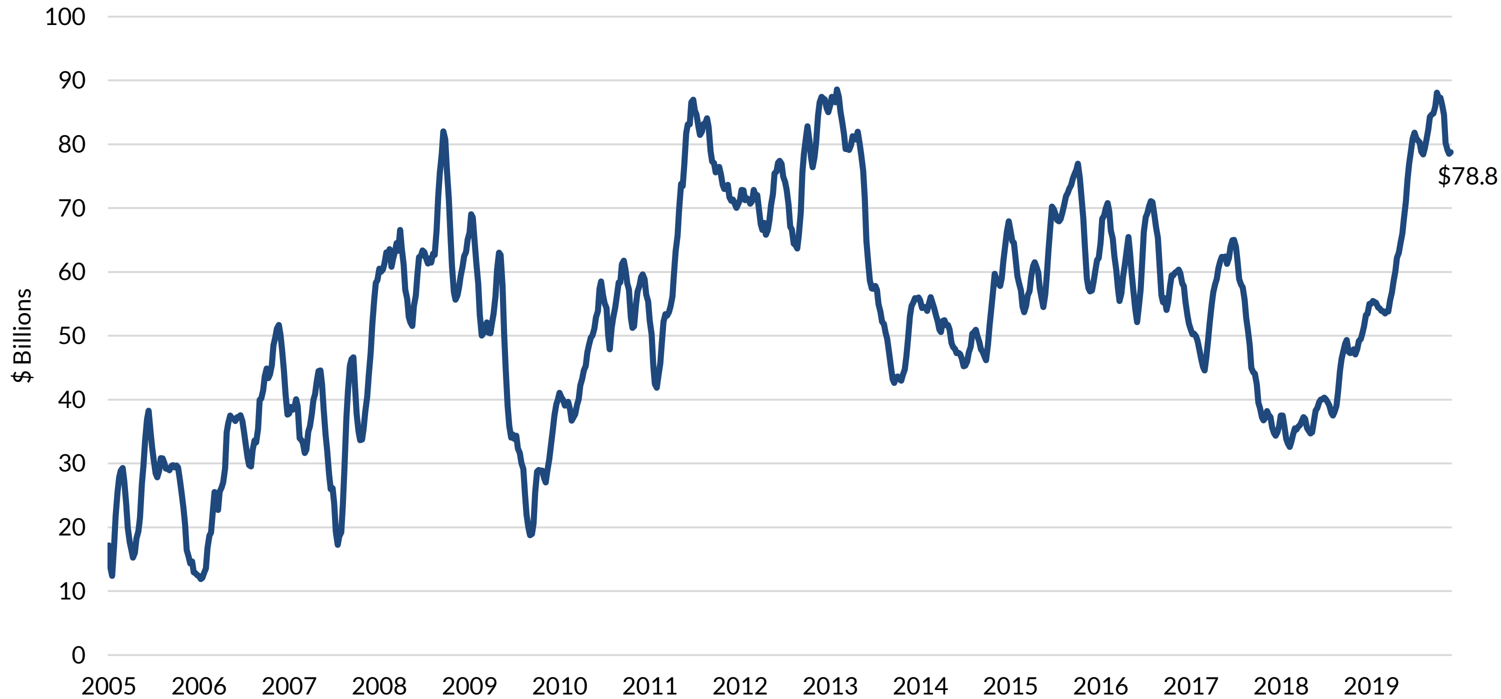


Sources: *SIFMA and Urban Institute.* ***Note:*** *Data as of November 2019.*

Market Conditions

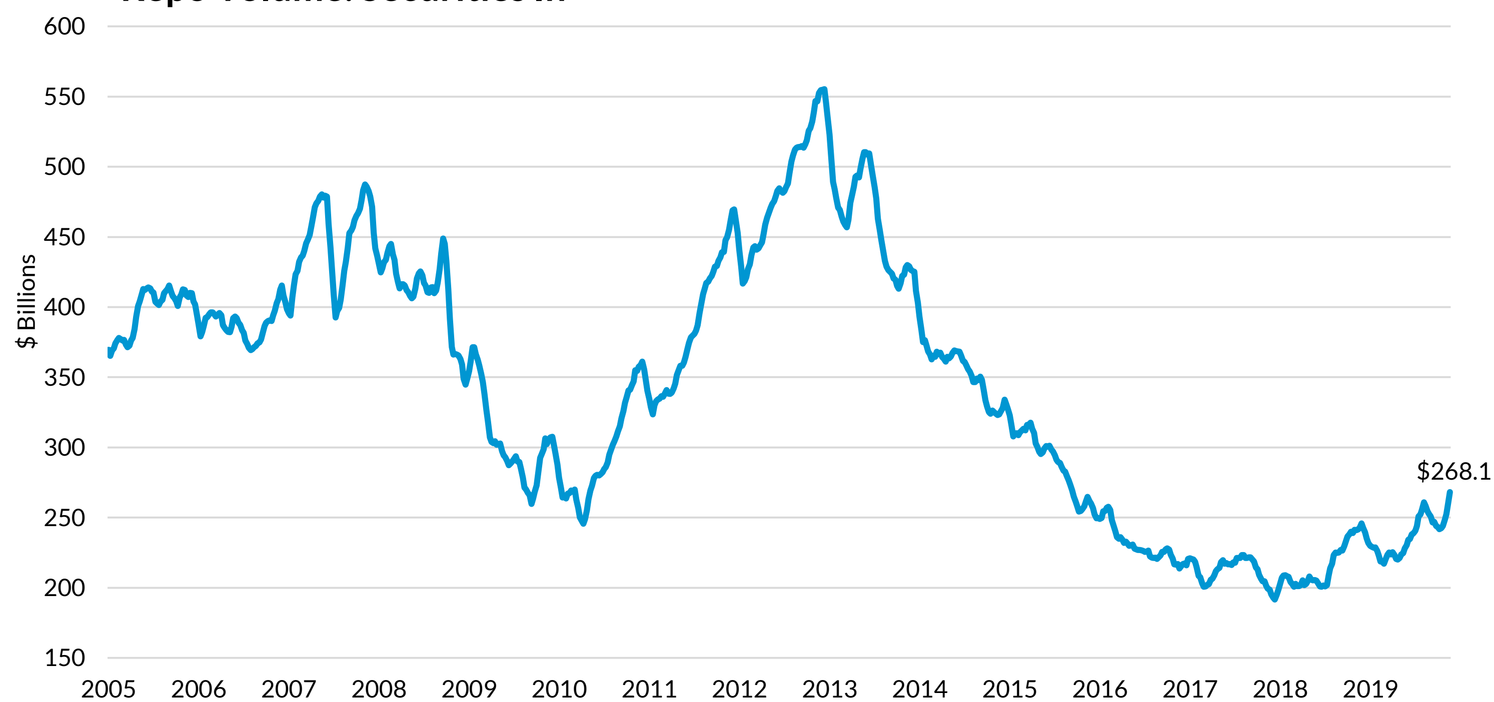
Dealer net positions are near their post-crisis highs. By contrast, dealer gross positions have fallen dramatically. The volume of repurchase activity is up from the near 13-year low in 2017. The large decline through time reflects banks cutting back on lower margin businesses.

Dealer Net Positions: Federal Agency and GSE MBS



Sources: *Federal Reserve Bank of New York Primary Dealer Statistics and Urban Institute.* **Note:** *Data as of November 2019.*

Repo Volume: Securities In

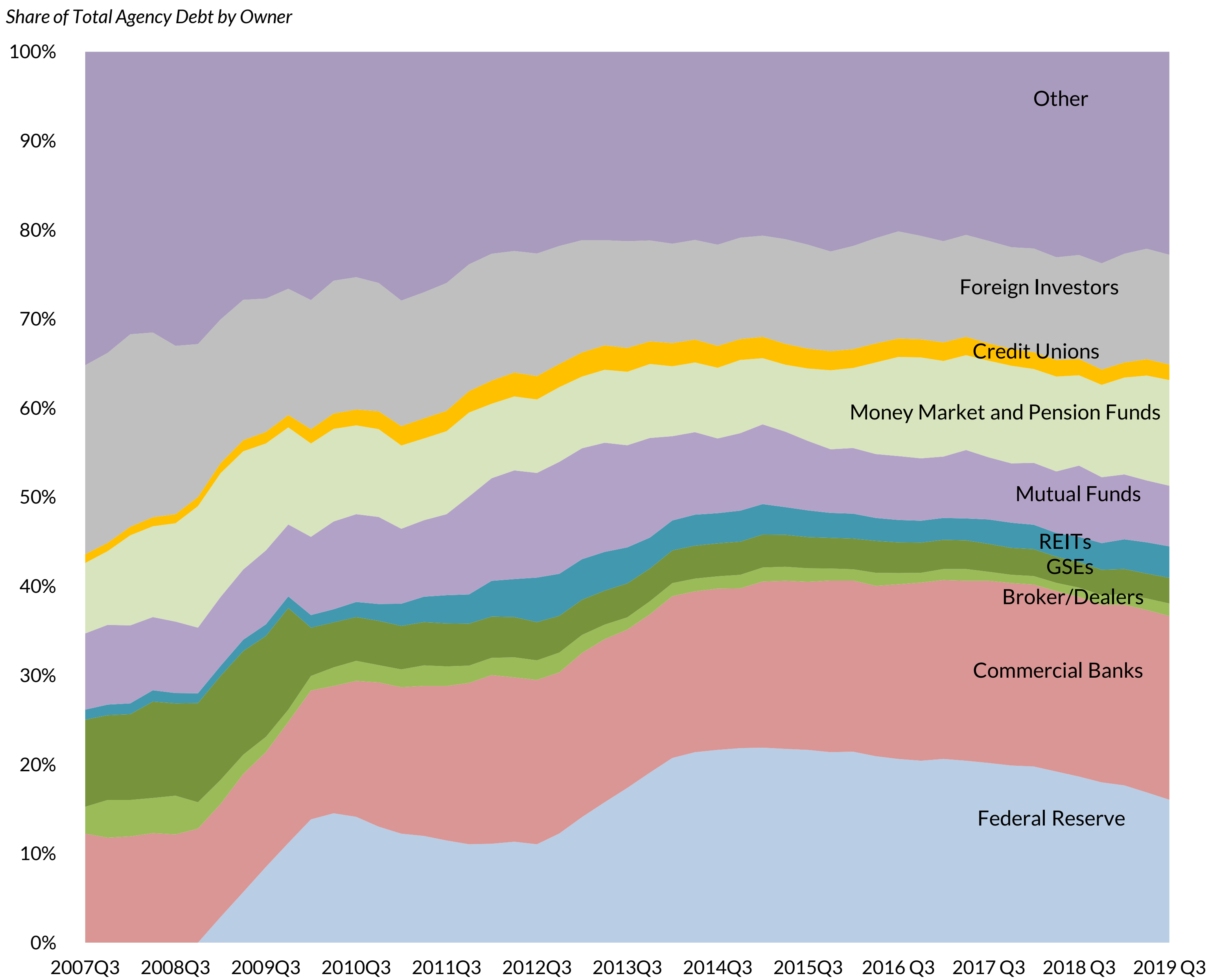


Sources: *Federal Reserve Bank of New York Primary Dealer Statistics and Urban Institute.* **Note:** *Data as of November 2019.*

MBS Ownership

The largest holders of agency debt (Agency MBS + Agency notes and bonds) include the Federal Reserve (16 percent), commercial banks (21 percent) and foreign investors (12 percent). The broker/dealer and GSE shares are a fraction of what they once were.

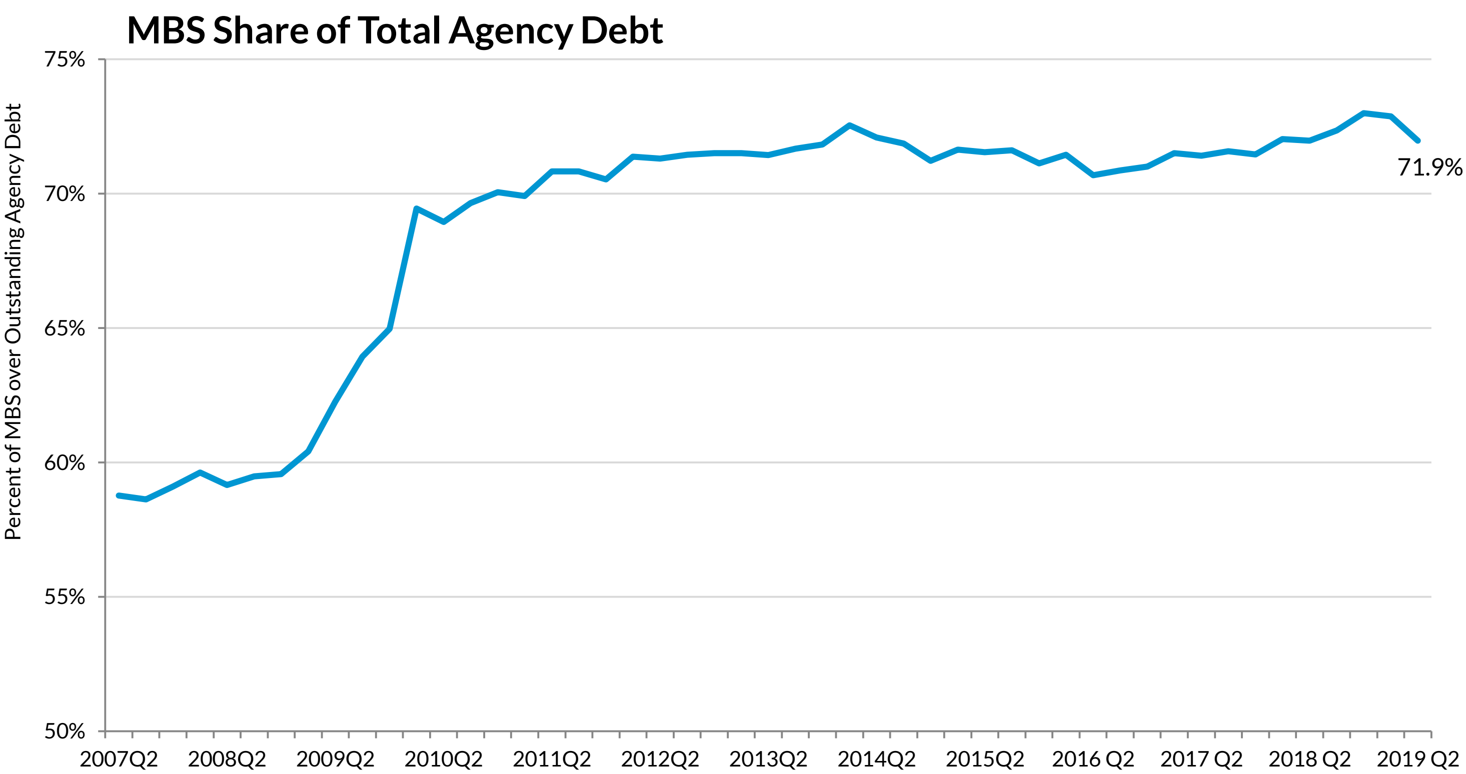
Who owns Total Agency Debt?



Sources: *Federal Reserve Flow of Funds and Urban Institute.* **Note***: The "other" category includes primarily life insurance companies, state and local govts, households, and nonprofits. Data as of Q3 2019.*

MBS Ownership

As Fannie and Freddie reduce the size of their retained portfolio, fewer agency notes and bonds are required to fund that activity, hence the MBS share of total agency debt increases. As of Q2 2019, the MBS share of total agency debt stood at 71.9 percent. Commercial banks are now the largest holders of Agency MBS. Out of their $2.1 trillion in holdings as of the end of November 2019, $1.5 trillion was held by the top 25 domestic banks.



***Sources**: Federal Reserve Flow of Funds and Urban Institute. **Note**: Data as of Q2 2019.*

	Commercial Bank Holdings ($Billions)								Week Ending			
	Oct-18	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Oct 30	Nov 6	Nov 13	Nov 20
Largest 25 Domestic Banks	1,320.0	1,431.0	1,434.2	1,452.0	1,455.0	1,465.0	1,491.5	1,504.6	1,504.8	1,515.1	1,528.3	1,525.1
Small Domestic Banks	484.5	501.0	502.4	506.6	512.1	513.0	518.2	523.1	523.3	526.3	527.9	525.4
Foreign Related Banks	23.4	26.6	29.0	27.7	28.3	33.1	35.3	37.6	37.2	37.1	36.8	41.7
Total, Seasonally Adjusted	1,827.9	1,958.6	1,965.6	1,986.3	1,995.4	2,011.1	2,045.0	2,065.3	2,065.3	2,078.5	2,093.0	2,092.2

***Sources**: Federal Reserve Bank and Urban Institute. **Note**: Small domestic banks includes all domestically chartered commercial banks not included in the top 25. Data as of November 2019.*

MBS Ownership

Out of the $2.0 trillion in MBS holdings at banks and thrifts as of Q3 2019, $1.5 trillion was agency pass-throughs: $1.1 trillion in GSE pass-throughs and $427 billion in Ginnie Mae pass-throughs. Another $429 billion was agency CMOs, while non-agency holdings totaled $40 billion. MBS holdings at banks and thrifts increased for the fourth quarter in a row in Q3 2019. This increase was broad based, coming from Ginnie Mae and GSE pass-throughs, agency CMOs as well as non-agency holdings.

Bank and Thrift Residential MBS Holdings

	All Banks & Thrifts ($Billions)						
	Total	Agency MBS PT	GSE PT	GNMA PT	Agency CMO	Private MBS PT	Private CMO
2000	$683.90	$392.85	$234.01	$84.26	$198.04	$21.57	$71.43
2001	$810.50	$459.78	$270.59	$109.53	$236.91	$37.62	$76.18
2002	$912.36	$557.43	$376.11	$101.46	$244.98	$20.08	$89.88
2003	$982.08	$619.02	$461.72	$75.11	$236.81	$19.40	$106.86
2004	$1,113.89	$724.61	$572.40	$49.33	$208.18	$20.55	$160.55
2005	$1,139.68	$708.64	$566.81	$35.92	$190.70	$29.09	$211.25
2006	$1,207.09	$742.28	$628.52	$31.13	$179.21	$42.32	$243.28
2007	$1,236.00	$678.24	$559.75	$31.58	$174.27	$26.26	$357.24
2008	$1,299.76	$820.12	$638.78	$100.36	$207.66	$12.93	$259.04
2009	$1,345.74	$854.40	$629.19	$155.00	$271.17	$7.53	$212.64
2010	$1,433.38	$847.13	$600.80	$163.13	$397.30	$7.34	$181.61
2011	$1,566.88	$917.10	$627.37	$214.81	$478.82	$3.28	$167.70
2012	$1,578.86	$953.76	$707.87	$242.54	$469.27	$17.16	$138.67
2013	$1,506.60	$933.73	$705.97	$231.93	$432.60	$26.11	$114.15
2014	$1,539.32	$964.16	$733.71	$230.45	$449.90	$20.33	$104.94
2015	$1,643.56	$1,115.40	$823.10	$292.30	$445.39	$11.14	$71.63
2016	$1,736.93	$1,254.13	$930.67	$323.46	$419.80	$7.40	$55.60
1Q17	$1,762.38	$1,280.63	$950.72	$329.91	$419.34	$7.03	$55.39
2Q17	$1,798.66	$1,320.59	$985.12	$335.47	$417.89	$6.38	$53.79
3Q17	$1,838.93	$1,364.75	$1,012.89	$351.86	$418.08	$5.65	$50.45
4Q17	$1,844.15	$1,378.53	$1,010.83	$367.70	$413.97	$4.63	$47.01
1Q18	$1,809.98	$1,352.28	$991.57	$360.71	$412.37	$3.92	$41.37
2Q18	$1,806.58	$1,345.80	$976.92	$368.88	$414.41	$7.45	$38.92
3Q18	$1,794.39	$1,339.72	$966.52	$373.21	$416.20	$2.42	$36.04
4Q18	$1,814.97	$1,361.00	$980.56	$380.43	$419.59	$2.69	$34.69
1Q19	$1,844.99	$1,385.10	$1,001.61	$383.49	$422.18	$3.06	$34.65
2Q19	$1,907.13	$1,445.91	$1,037.93	$407.97	$421.56	$2.90	$36.76
3Q19	$1,975.78	$1,506.92	$1,079.82	$427.10	$428.69	$4.74	$35.44

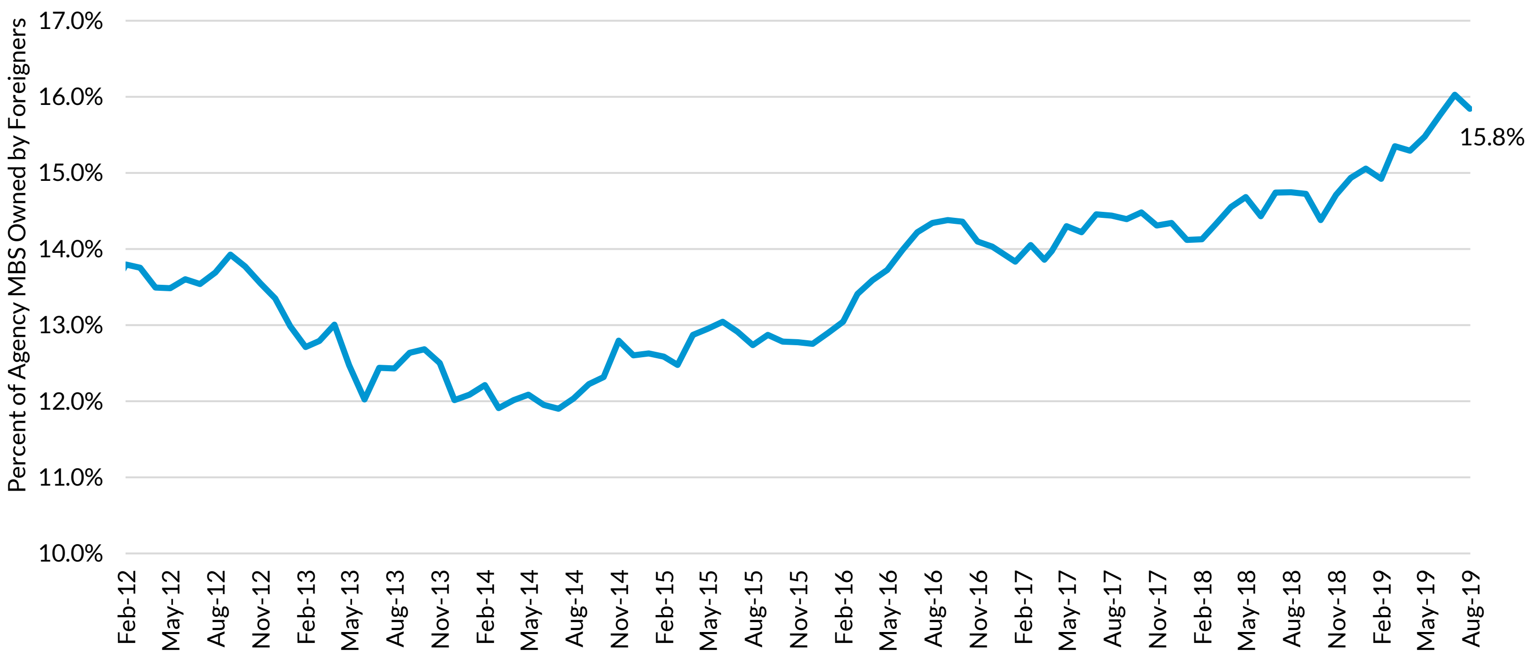
	Top Bank & Thrift Residential MBS Investors	Total ($MM)	GSE PT ($MM)	GNMA PT ($MM)	Agency REMIC ($MM)	Non-Agency ($MM)	Market Share
1	Bank of America Corporation	$321,946	$183,062	$128,029	$10,760	$95	16.3%
2	Wells Fargo & Company	$257,583	$183,897	$69,614	$3,220	$852	13.0%
3	JP Morgan Chase & Co.	$140,403	$95,347	$31,927	$227	$12,902	7.1%
4	U S. Bancorp.	$92,916	$39,656	$31,241	$22,017	$1	4.7%
5	Charles Schwab Bank	$90,372	$51,499	$20,452	$18,421	$0	4.6%
6	Capital One Financial Corporation	$72,536	$60,813	$3,116	$7,119	$1,488	3.7%
7	Citigroup Inc.	$65,843	$27,719	$14,661	$22,622	$841	3.3%
8	Bank of New York Mellon Corp.	$54,546	$32,443	$4,103	$16,699	$1,301	2.8%
9	PNC Bank, National Association	$52,437	$44,728	$3,134	$2,497	$2,078	2.7%
10	State Street Bank and Trust Company	$48,315	$19,893	$5,639	$22,409	$374	2.4%
11	Branch Banking and Trust Company	$43,243	$22,785	$11,059	$6,762	$2,637	2.2%
12	Morgan Stanley	$27,252	$6,033	$12,317	$8,900	$2	1.4%
13	E*TRADE Bank	$25,044	$14,231	$6,493	$4,320	$0	1.3%
14	HSBC Banks USA, National Association	$24,252	$14,951	$2,385	$4,226	$2,690	1.2%
15	KeyBank National Association	$22,532	$10,951	$10,686	$894	$0	1.1%
16	SunTrust Bank	$22,193	$10,312	$3,296	$8,585	$0	1.1%
17	Ally Bank	$22,002	$1,604	$793	$19,605	$0	1.1%
18	Citizens Bank	$21,688	$10,692	$5,459	$4,679	$858	1.1%
19	Regions Bank	$20,114	$16,475	$2,391	$1,248	$0	1.0%
20	MUFG Union Bank	$17,370	$2,325	$533	$14,173	$338	0.9%
	Total Top 20	**$1,442,585**	**$849,416**	**$367,331**	**$199,382**	**$26,456**	**73.0%**

Sources: *Inside Mortgage Finance and Urban Institute.* ***Note:*** *Data as of Q3 2019.*

MBS Ownership

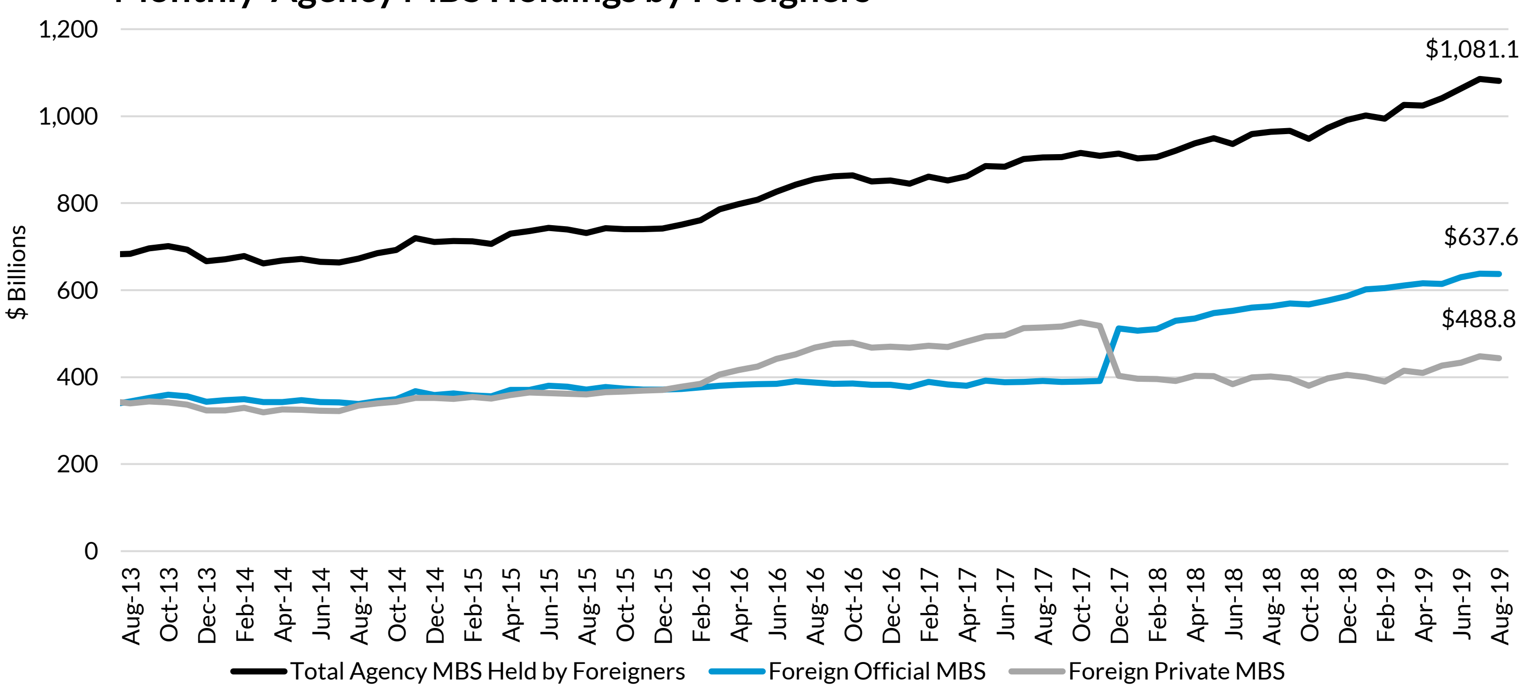
Foreign investors held 15.8 percent of agency MBS in August 2019, up from a low of 11.9 percent in July 2014. For the month of August 2019, this represents $1.08 trillion in Agency MBS, $488.8 billion held by foreign private institutions and $637.6 billion held by foreign institutions.

Foreign Share of Agency MBS



Sources: *SIFMA and Treasury International Capital (TIC).* ***Note***: *Data as of August 2019.*

Monthly Agency MBS Holdings by Foreigners



Sources: *Treasury International Capital (TIC) and Urban Institute.* ***Note***: *Data as of August 2019. In December 2017, there was a data correction that moved about $120 billion from privately held U.S. agency bonds to officially held U.S. agency bonds; this resulted in a series break at December 2017 in the split between the portion held by foreign private and the portion held by foreign official.*

MBS Ownership

The largest foreign holders of Agency MBS are Japan, Taiwan, and China; these three comprise over 70 percent of all foreign holdings. Between June 2018 and August 2019, we estimate China has increased their agency MBS holdings by $55.9 billion, Japan has increased their holdings by $49.2 billion and Taiwan has increased their holdings by $13.6 billion.

Agency MBS+ Agency Debt

	Level of Holdings ($Millions)*							Change in Holdings ($Millions)*					
Country	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Jul-19	Aug-19	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Jul-19	Aug-19
Japan	257,547	254,511	271,999	284,322	296,445	306,913	306,853	-3,036	17,488	12,323	12,123	10,468	-60
Taiwan	250,009	250,639	261,262	265,992	265,520	263,462	263,632	630	10,623	4,730	-472	-2,058	170
China	180,635	190,203	188,921	208,540	227,312	235,487	236,691	9,568	-1,282	19,619	18,772	8,175	1,204
Ireland	46,817	48,220	48,045	46,623	44,979	43,940	42,769	1,403	-175	-1,422	-1,644	-1,039	-1,171
Luxembourg	36,372	38,800	50,869	44,561	45,144	45,039	43,724	2,428	12,069	-6,308	583	-105	-1,315
South Korea	44,039	43,944	44,794	42,604	42,669	42,597	41,867	-95	850	-2,190	65	-72	-730
Bermuda	27,866	27,610	28,651	28,535	29,377	29,254	29,318	-256	1,041	-116	842	-123	64
Cayman Islands	31,017	31,638	31,405	30,374	30,885	31,043	29,839	621	-233	-1,031	511	158	-1,204
Malaysia	12,710	12,874	12,671	12,395	12,108	12,851	14,865	164	-203	-276	-287	743	2,014
Netherlands	11,995	12,229	9,601	9,400	13,548	13,180	10,888	234	-2,628	-201	4,148	-368	-2,292
Rest of World	125,197	128,807	129,345	129,987	128,056	133,972	133,924	3,610	538	642	-1,931	5,916	-48
Total	1,024,200	1,039,475	1,077,563	1,103,333	1,136,043	1,157,738	1,154,370	15,275	38,088	25,770	32,710	21,695	-3,368

Agency MBS Only (Estimates)

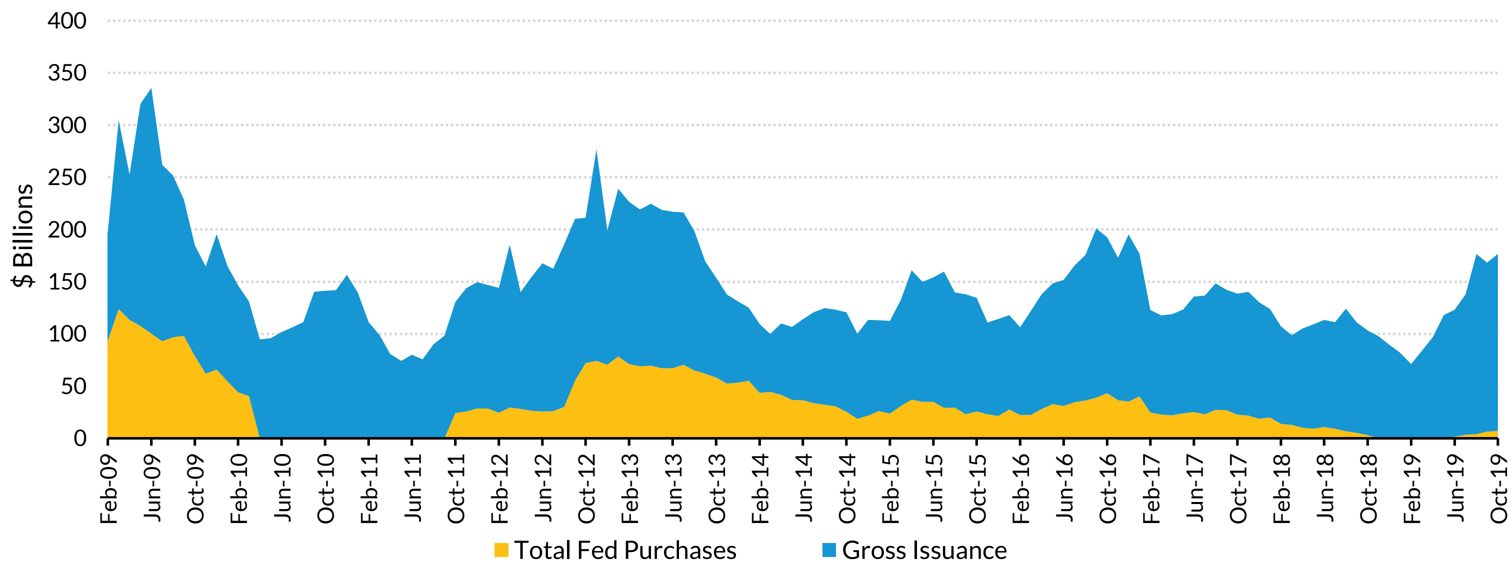
	Level of Holdings ($Millions)*							Change in Holdings ($Millions)*					
Country	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Jul-19	Aug-19	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Jul-19	Aug-19
Japan	253,972	250,851	268,119	280,394	292,762	303,284	303,140	-3,121	17,268	12,275	12,368	10,522	-144
Taiwan	249,773	250,397	261,006	265,733	265,277	263,222	263,387	624	10,608	4,727	-456	-2,054	164
China	176,345	185,811	184,265	203,827	222,893	231,132	232,235	9,466	-1,546	19,562	19,066	8,239	1,103
Ireland	37,832	39,021	38,293	36,751	35,723	34,819	33,437	1,189	-729	-1,542	-1,028	-904	-1,382
Luxembourg	34,012	36,384	48,307	41,968	42,713	42,643	41,273	2,372	11,924	-6,339	745	-70	-1,370
South Korea	33,064	32,708	32,882	30,546	31,363	31,456	30,468	-356	174	-2,336	817	93	-988
Bermuda	24,969	24,644	25,507	25,352	26,393	26,313	26,309	-325	863	-155	1,040	-79	-4
Cayman Islands	24,384	24,847	24,206	23,086	24,052	24,309	22,950	463	-642	-1,119	965	258	-1,360
Malaysia	12,319	12,474	12,247	11,965	11,705	12,454	14,459	155	-227	-281	-260	749	2,005
Netherlands	11,437	11,658	8,995	8,787	12,973	12,614	10,308	221	-2,662	-208	4,186	-360	-2,305
Rest of World	95,510	98,414	97,123	97,370	97,473	103,835	103,089	2,904	-1,291	247	103	6,362	-746
Total	953,612	967,209	1,000,948	1,025,779	1,063,325	1,086,080	1,081,053	13,597	33,739	24,831	37,546	22,755	-5,027

Sources *:Treasury International Capital (TIC) and Urban Institute.*
Note: **calculated based on June 2018 report with amount asset backed per country. Revised to include Top 10 holders of MBS listed as of June 2018. Monthly data as of August 2019.*

MBS Ownership

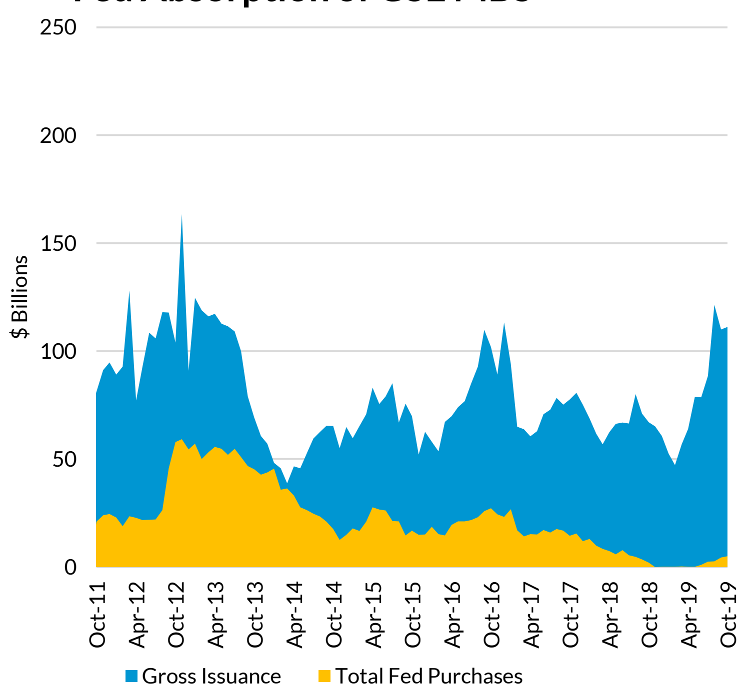
The Federal Reserve is actively winding down its mortgage portfolio; MBS purchases are very low. During the period October 2014-September 2017, the Fed ended its purchase program, but was reinvesting proceeds from mortgage and agency debt into the mortgage market, absorbing 20-30 percent of agency gross issuance. In October 2017, the Fed began to taper their mortgage holdings, initially letting securities run off at the rate of $4 billion per month in Q4, 2017; $8 billion per month in Q1, 2018; $12 billion per month in Q2; $16 billion per month in Q3; and $20 billion per month in Q4, 2018 and thereafter. With the Fed now at its maximum taper, Fed absorption of gross issuance was 4.08 percent in October.

Total Fed Absorption



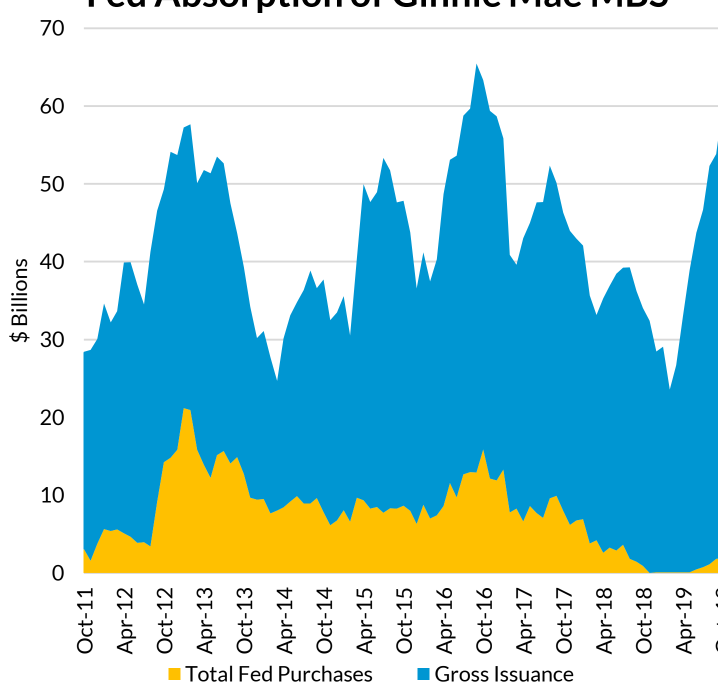
***Sources**: eMBS, Federal Reserve Bank of New York and Urban Institute. **Note:** Data as of October 2019.*

Fed Absorption of GSE MBS



***Sources**: eMBS, Federal Reserve Bank of New York and Urban Institute. **Note:** Data as of October 2019.*

Fed Absorption of Ginnie Mae MBS



***Sources**: eMBS, Federal Reserve Bank of New York and Urban Institute. **Note**: Data as of October 2019.*

Disclosures

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