Global Markets Analysis Report

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Ginnie Mae
Our Guaranty Matters

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

CONTENTS

HIGHLIGHTS

Ginnie Mae's Actions to Help Curb Lending Abuse Continue to be a Focus

Last month we introduced new charts showing prepayment speeds for 2017 and 2018 vintage Ginnie Mae II, Fannie Mae, and Freddie Mac MBS. Page 41 shows prepayment speeds for 2017-issued 3.5s and 2018- issued 4.0s, the largest coupon cohorts in each respective year. The CPR for 2017-issued Ginnie II 3.5s (top chart on page 41) was running well below Fannie and Freddie CPR until around mid-year 2017, after which Ginnie II speeds exceeded conventional speeds.

Page 42 shows CPRs by loan age for 2017 and 2018-issued cohorts 50 bps above the largest cohorts, i.e. for 2017 4.0s and 2018 4.5s. The top chart shows a dramatic uptick in Ginnie II speeds for 2017-issued 4s, starting at month 7; speeds peaked between loan age of 7 and 9 months, followed by a substantial drop. This pattern is not present in the 2018 4.5s. Instead, we see 2018 issuances prepaying more slowly during the entire first year 2018, a typical pattern for less affluent borrowers.

The sharp jump in speeds for 2017-issued Ginnie II 3.5 and 4.0 cohorts was driven to some extent by questionable lending practices that result in multiple refinancing of the same property over a short period of time. Higher prepayment risk led MBS investors to demand a yield premium for Ginnie Mae mortgage backed securities, raising mortgages rates for both veterans and first-time homebuyers.

Starting in fall 2017, Ginnie Mae began taking decisive action to curb these abusive practices, including suspending responsible lenders as well as imposing additional requirements that prohibit securitization into Ginnie II pools unless certain seasoning requirements are met. In 2018, the VA implemented a borrower net tangible benefit test to include thresholds for interest rate reduction refinance expense recoupment. The drop in CPR for 2017 4.0s after month 10 and the more stable CPR for 2018 vintages on 4.0s and 4.5s suggest that the above measures to curb this abuse are producing positive results.

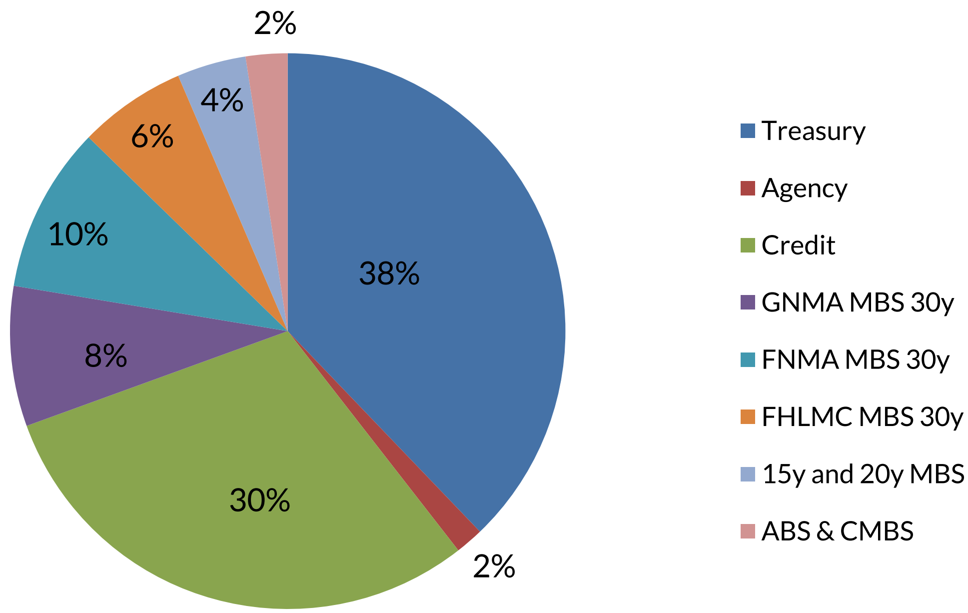
***Highlights this month*:**

- In November 2018, US MBS spreads widened (page 6), and look considerably more attractive versus German government bonds (page 8).
- Serious delinquency rates continued to decline in Q3 2018 (page 11).
- Ginnie Mae reverse mortgage issuance volume bounced back to the historical average level in October 2018 (page 43).
- Bank and thrift total MBS holdings declined while their Ginnie Mae pass-throughs holdings continued to grow in Q3 2018 (page 49).
- Fed absorption of gross issuance dropped to a new historical low in October 2018, as the Fed's monthly MBS taper size reached the maximum level of $20 billion in Q4 2018 (page 52).

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

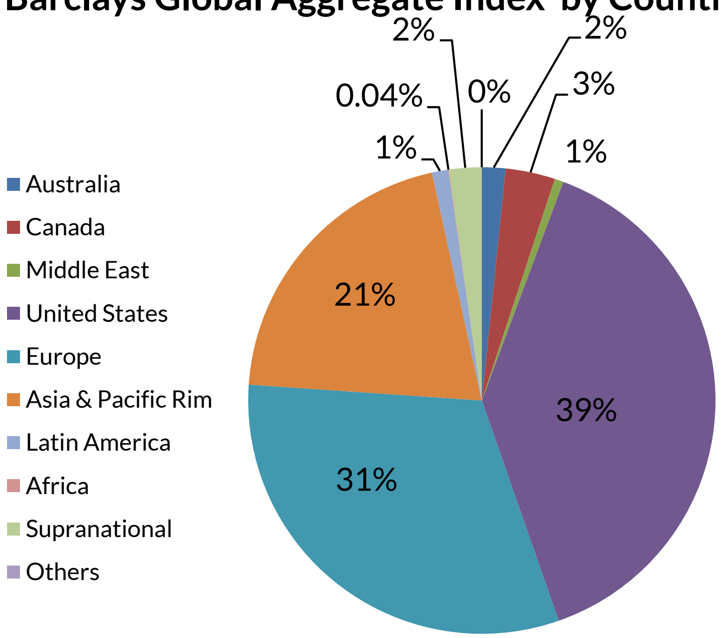
US MBS comprise 28 percent of the Barclays US Aggregate Index- less than either the US Treasury share (38%) or the US Credit share (30%). Fannie Mae 30-year MBS comprises the largest percent of US MBS (10%), while Ginnie Mae 30-year MBS and Freddie Mac 30-year MBS comprise 8 percent and 6 percent of the market, respectively. Mortgages with terms of 15 and 20 years comprise the remaining balance (4%) of the US MBS share. US securities are the largest single contributor to the Barclays Global Aggregate, accounting for 39 percent of the global total. US MBS comprises 11 percent of the global aggregate.

Barclays US Aggregate Index



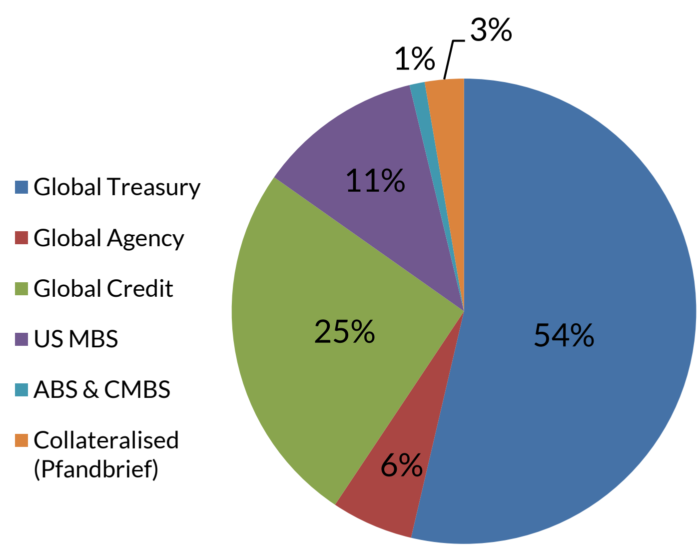
Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of September 2018.*

Barclays Global Aggregate Index by Country



Sources: *Bloomberg and State Street Global Advisors.*
Note: *Data as of September 2018.*

Barclays Global Aggregate Index by Sector

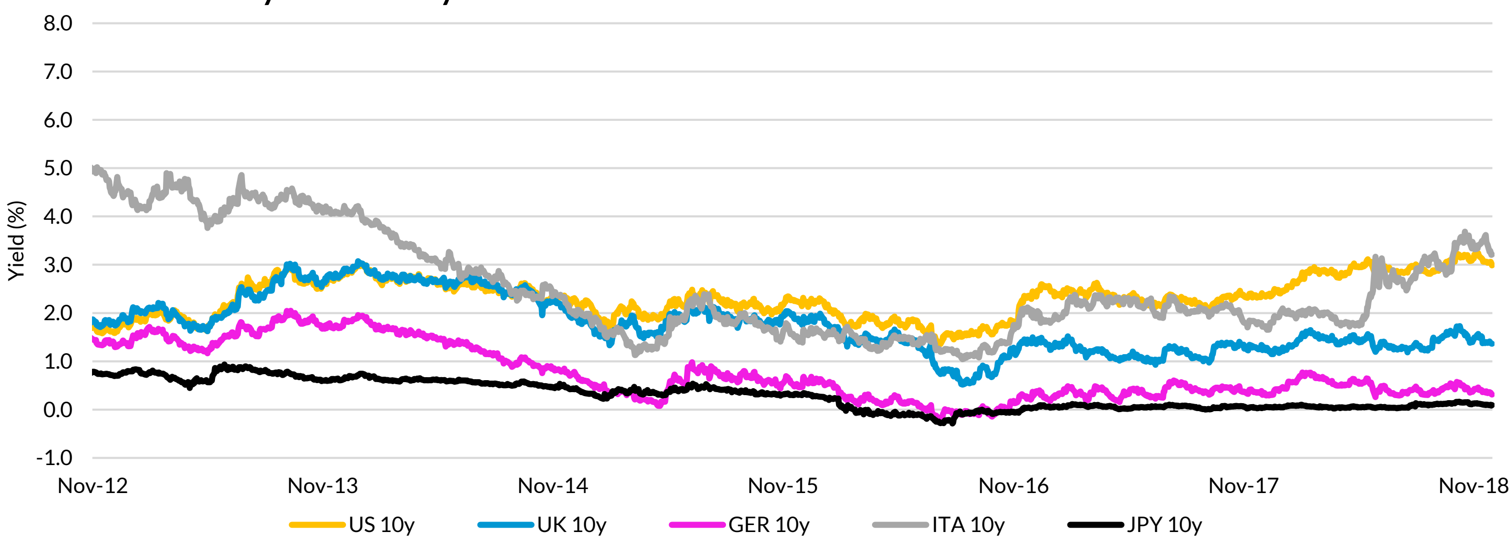


Sources: *Bloomberg and State Street Global Advisors*
Note: *Data as of September 2018.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

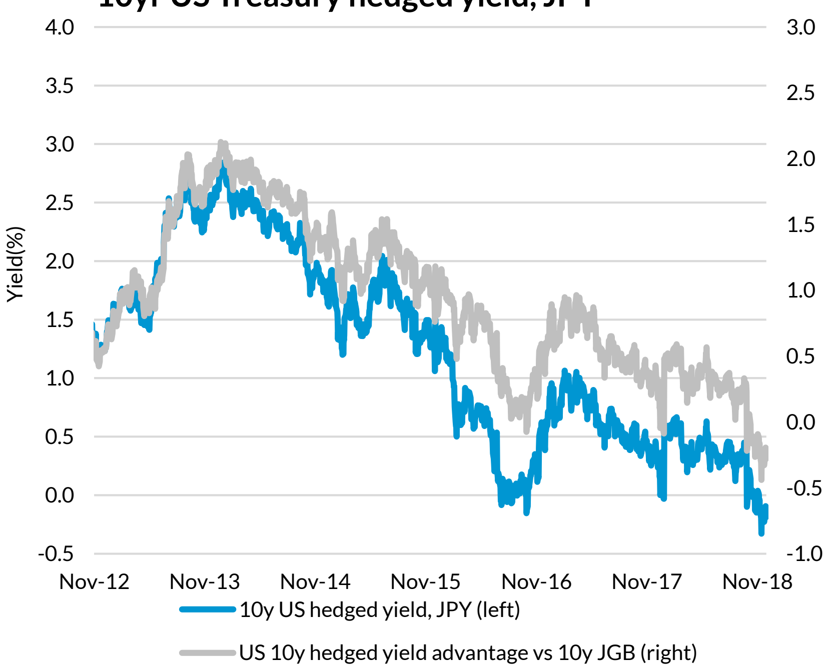
US Treasury interest rates, as measured by the 10-year note, have consistently been the highest in the developed world over the past few years, but was surpassed by Italy in August 2018. In November 2018, the US 10-year note decreased to 2.99, remaining below the Italian 10-year note, which stood at 3.21. Interest rates in the UK, Germany, and Japan all decreased to 1.36, 0.31, and 0.09, respectively. In September, due to a large increase in the cost of currency hedging at the end of Q3, 10-year US Treasury yields hedged into foreign currency dropped sharply. Consequently, the hedged yield differential between the 10-year Treasuries and other 10-year instruments, specifically JGBs and Bunds, now stands at -30 bps and -60 bps, respectively.

Global 10-year Treasury Yields



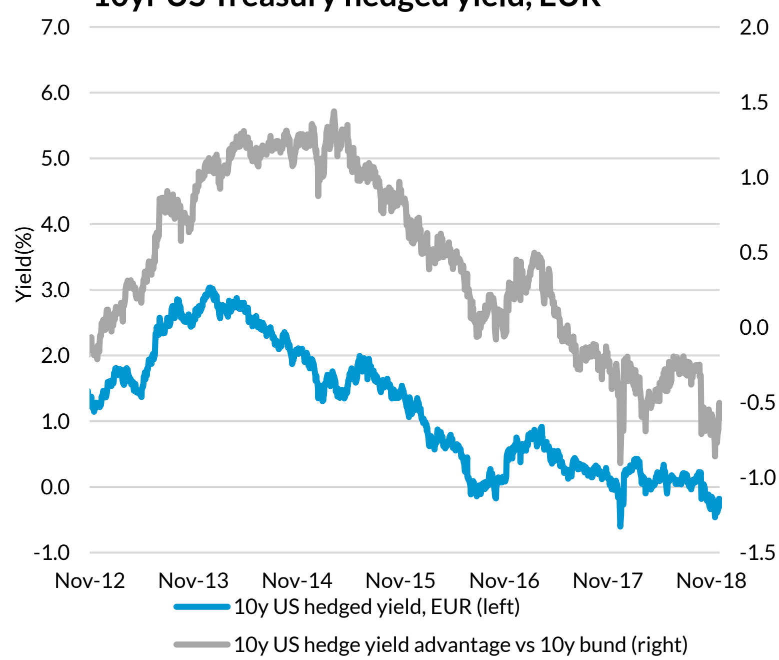
Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2018.*

10yr US Treasury hedged yield, JPY



Sources: *Bloomberg and State Street Global Advisors.*
Note: *Data as of November 2018.*

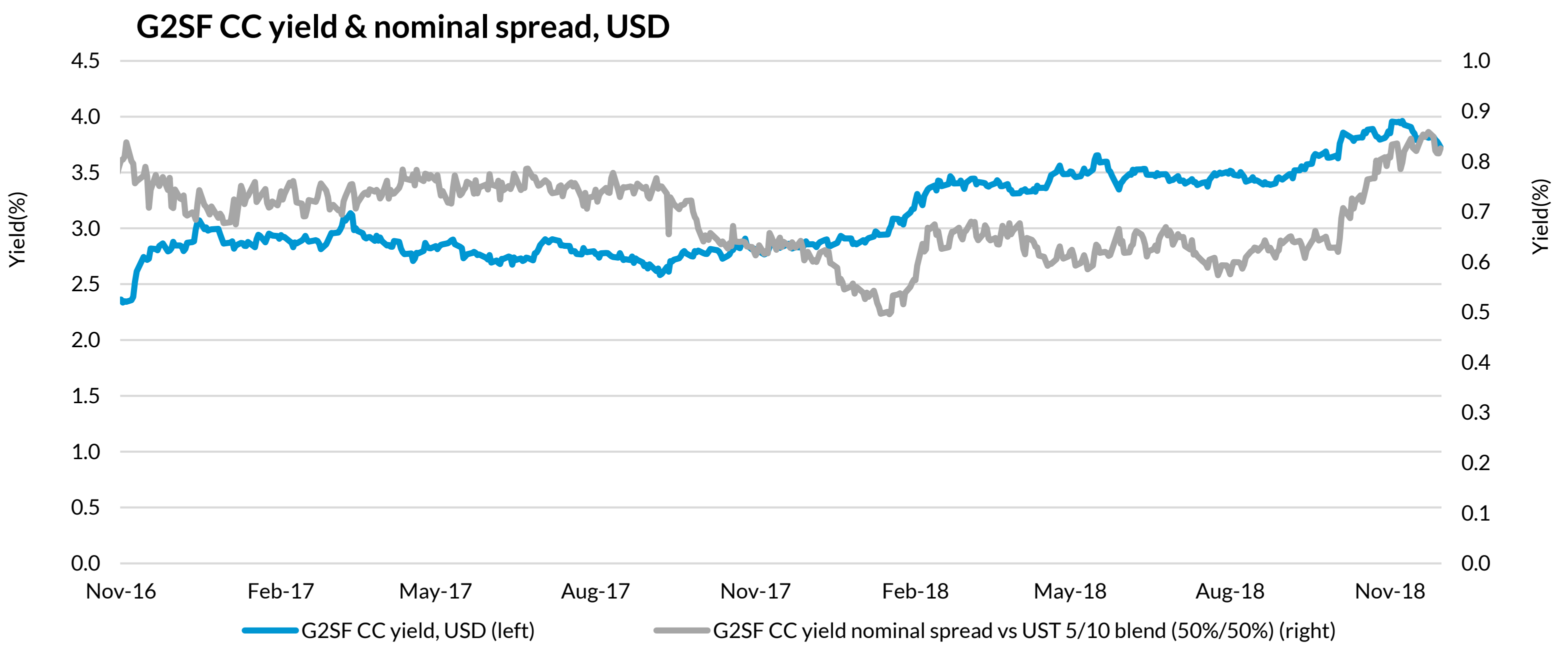
10yr US Treasury hedged yield, EUR



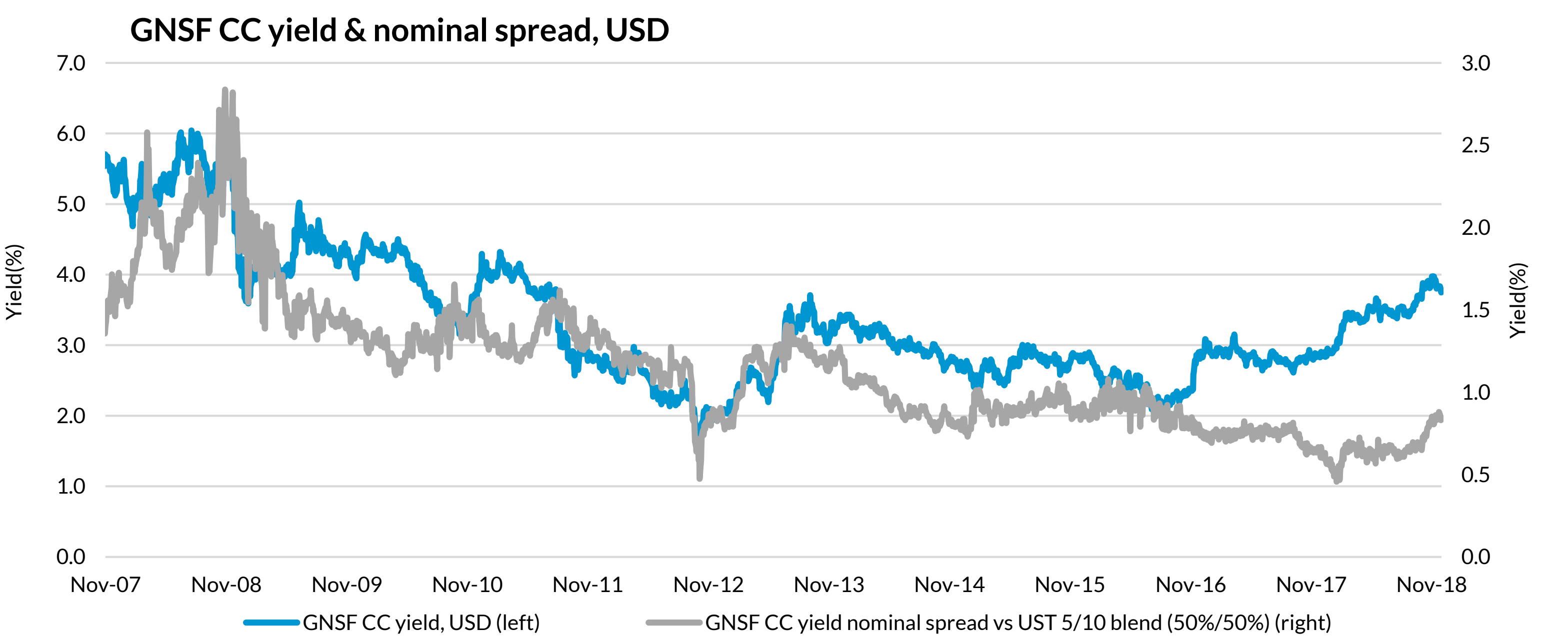
Sources: *Bloomberg and State Street Global Advisors*
Note*: Data as of November 2018.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

The nominal yield on both the current coupon GNMA II and GNMA I securities decreased in November 2018. Current coupon Ginnie Mae securities outyield their Treasury counterparts (relative to the average of 5- and 10-year Treasury yields) by 83 and 85 bps on G2SF and GNSF, respectively, a 2 point widening from October 2018. Cumulatively, this represents a widening of 19 basis points over the last 3 months.



Sources: *Bloomberg and State Street Global Advisors.* ***Note****: Data as of November 2018.*

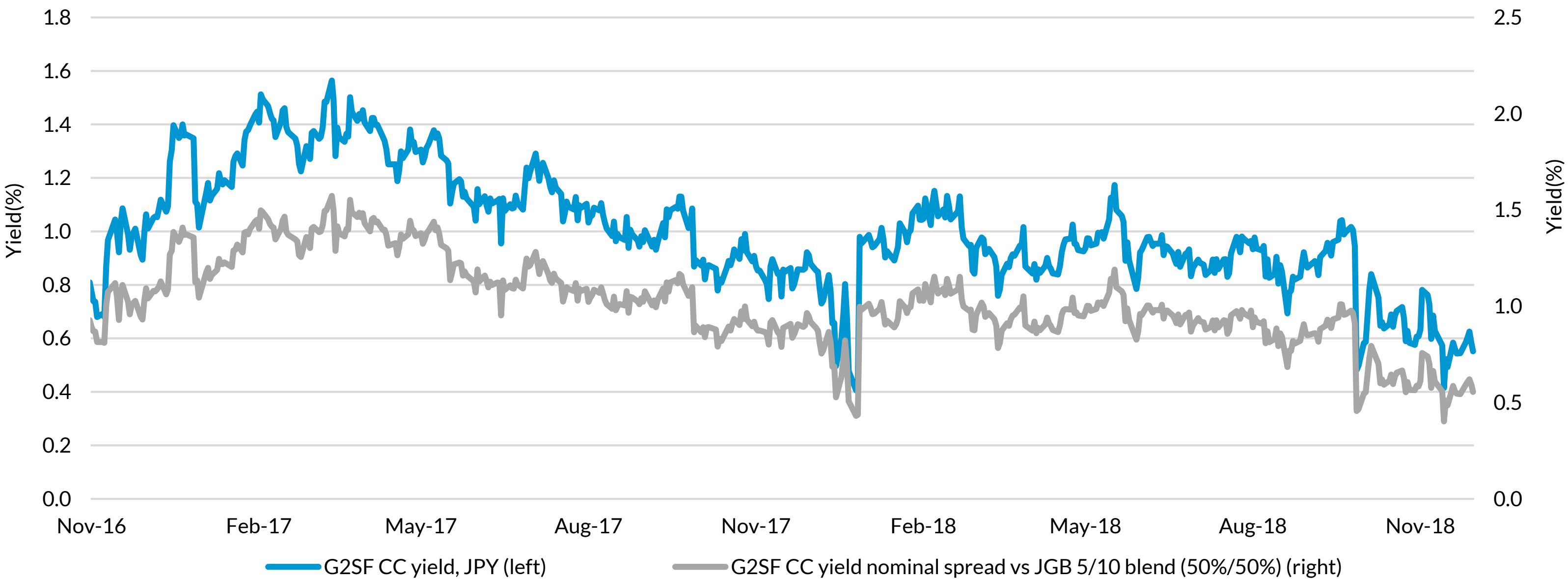


Sources: *Bloomberg and State Street Global Advisors.* ***Note:*** *Data as of November 2018.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

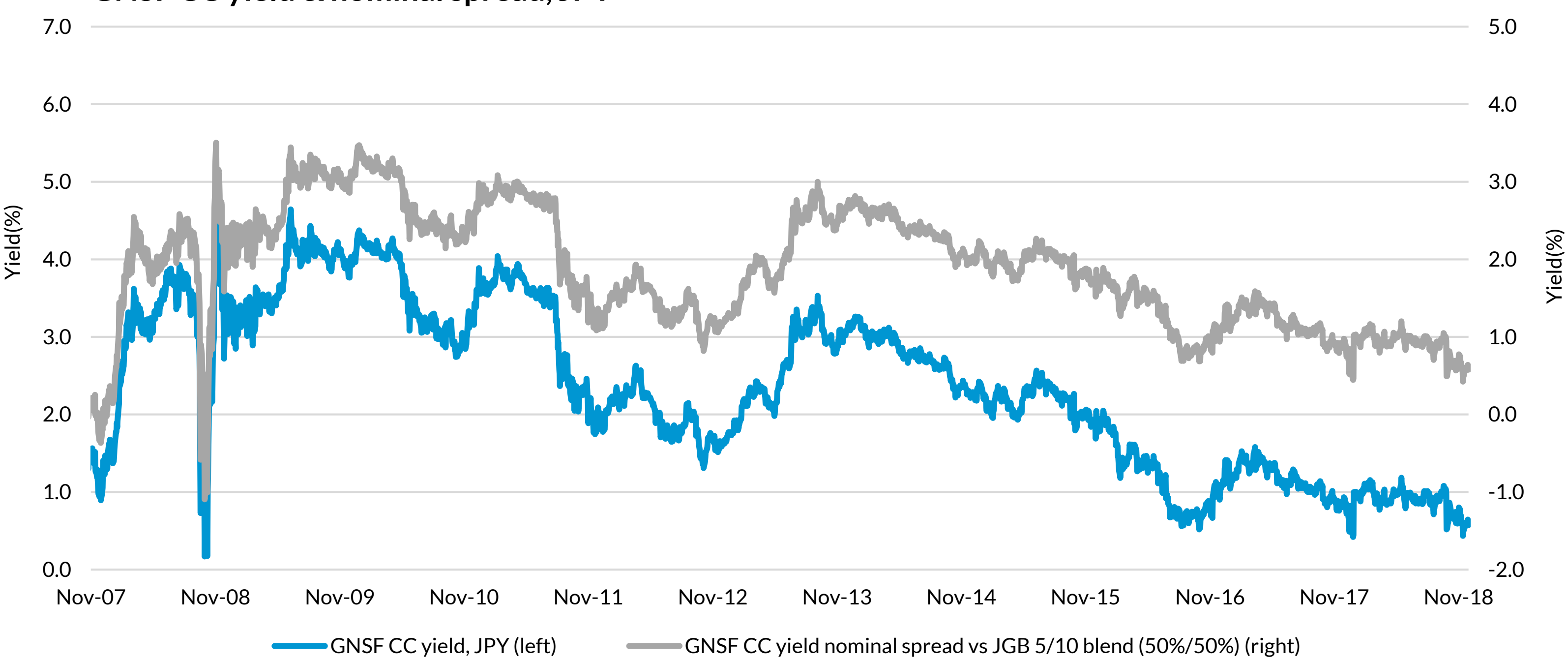
If Ginnie Mae securities are hedged into foreign currencies, they look attractive on a yield basis versus many sovereign alternatives. The figures show that in November, current coupon G2SF and GNSF hedged into Japanese yen yield more than the JGB 5/10 blend by 56 and 58 bps, respectively. These latest spreads represent a 2 point narrowing from October levels.

G2SF CC yield & nominal spread, JPY



***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2018.*

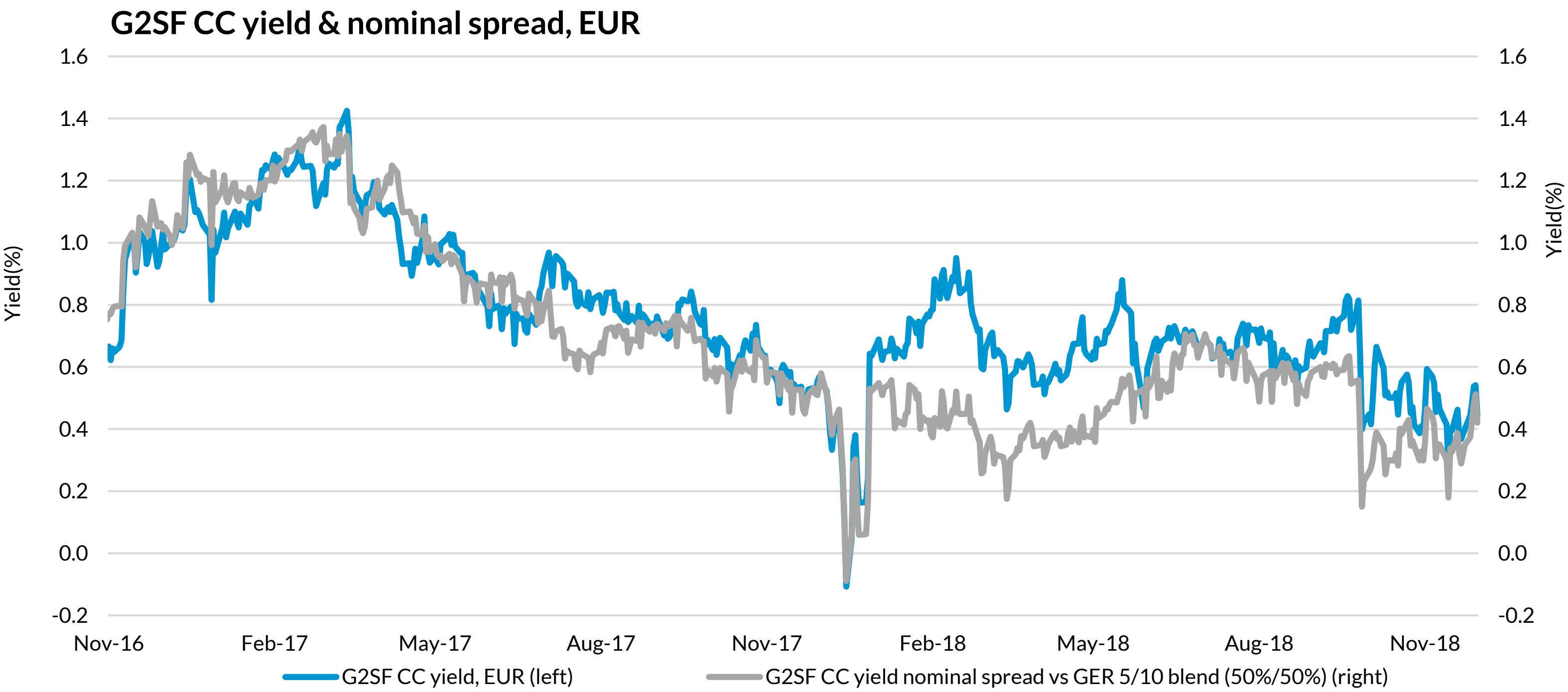
GNSF CC yield & nominal spread, JPY



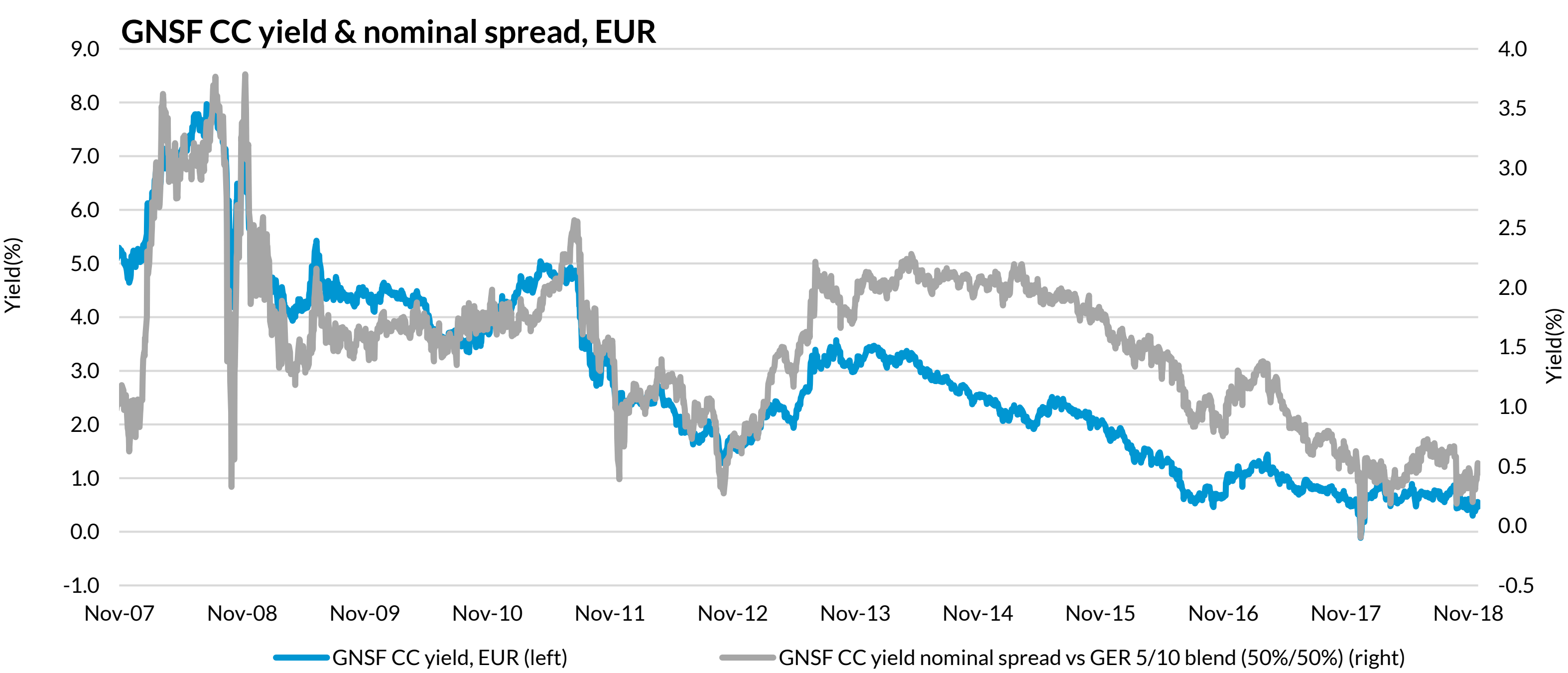
***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2018.*

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

If Ginnie Mae securities are hedged into foreign currencies, they look attractive on a yield basis versus sovereign alternatives. The figures show that in November, current coupon G2SF and GNSF hedged into euros yield more than the average of the German 5/10 blend by 42 and 44 bps, respectively. These latest spreads represent a 12-13 bps widening from October levels.



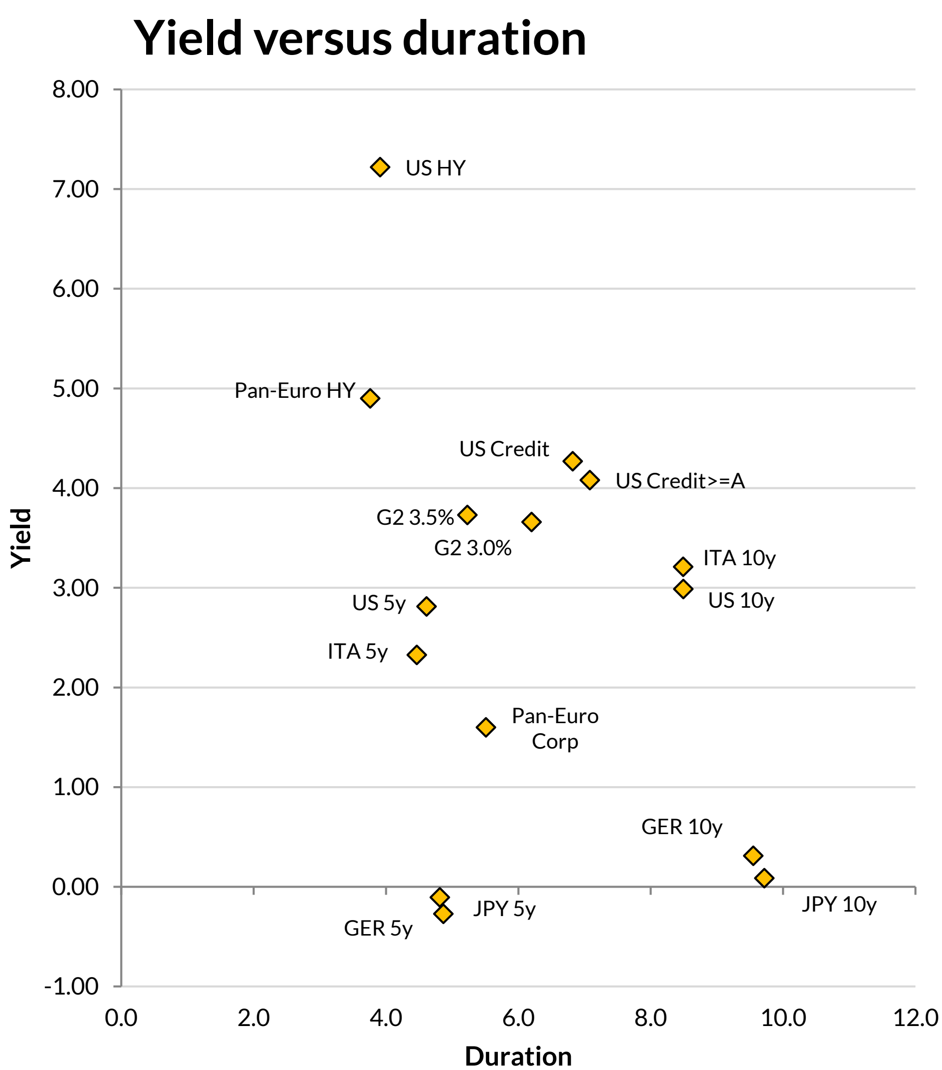
***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2018.*



***Sources:** Bloomberg and State Street Global Advisors. **Note:** Data as of November 2018.*

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 security class with significantly more yield is the US high yield index, where duration, a measure of sensitivity to interest rate changes, does not fully capture the volatility of the high yield asset class. Investors are unable to match the yield on Ginnie Mae securities, while preserving the full government guarantee, even if they extend their duration significantly.



Security	Duration	Yield
US 5y	4.6	2.8
US 10y	8.5	3.0
GNMA II 3%	5.2	3.7
GNMA II 3.5%	6.2	3.7
JPY 5y	4.8	-0.1
JPY 10y	9.7	0.1
GER 5y	4.9	-0.3
GER 10y	9.5	0.3
ITA 5y	4.5	2.3
ITA 10y	8.5	3.2
US credit	6.8	4.3
US credit >= A	7.1	4.1
US HY	3.9	7.2
Pan-Euro Corp	5.5	1.6
Pan-Euro HY	3.8	4.9

***Sources:** Bloomberg and State Street Global Advisors. **Note**: Yields are in base currency of security and unhedged.*
Data as of November 2018.

Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

The average return on the Ginnie Mae index over the past decade has been slightly higher than the US Treasury index, but lower than many alternatives, including the US Investment-Grade Corporate and US and European High Yield indices. However, the standard deviation of the Ginnie Mae index is the lowest of any sector, as it has the least price volatility. The result: the excess return per unit of risk for the US mortgage market is comparable to US and European investment grade credit; it is higher than US Treasuries.

	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	-0.05	-0.08	-0.26	-0.15	0.03	-0.25
3 year	0.08	0.06	0.21	0.03	0.58	0.20
5 year	0.16	0.12	0.25	0.24	0.37	0.33
10 year	0.26	0.19	0.53	0.45	0.98	1.07

	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	-0.20	-0.23	-0.41	-0.09	-0.12	-0.20
3 year	-0.01	-0.03	0.13	0.09	0.50	0.26
5 year	0.11	0.07	0.20	0.28	0.32	0.38
10 year	0.23	0.16	0.50	0.46	0.96	1.08

	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	0.67	0.82	0.87	0.28	0.83	0.94
3 year	0.57	0.93	1.08	0.82	1.39	1.30
5 year	0.59	0.91	1.08	0.97	1.44	1.25
10 year	0.69	1.09	1.42	1.27	2.27	2.88

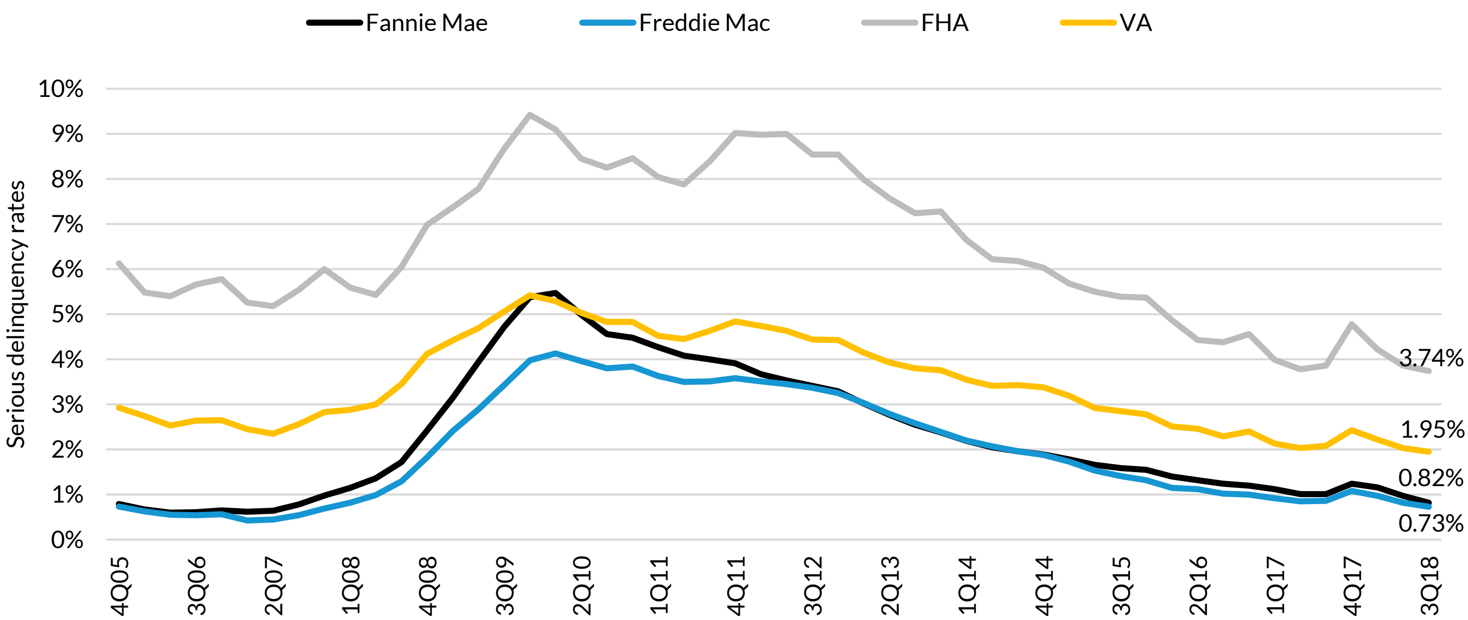
	Sharpe Ratio					
Time Period	US MBS Ginnie Mae	US Treasury	US Credit Corp	Pan Euro Credit Corp	US High Yield	Pan Euro High Yield*
1 year	-0.30	-0.29	-0.47	-0.34	-0.15	-0.21
3 year	-0.01	-0.03	0.12	0.11	0.36	0.20
5 year	0.18	0.07	0.18	0.29	0.22	0.30
10 year	0.34	0.15	0.35	0.36	0.42	0.38

**Assumes 2% capitalization max per issuer on high yield indices*
***Sources:** Barclays Indices, Bloomberg and State Street Global Advisors* ***Note:** Data as of November 2018.*

State of the US Housing Market

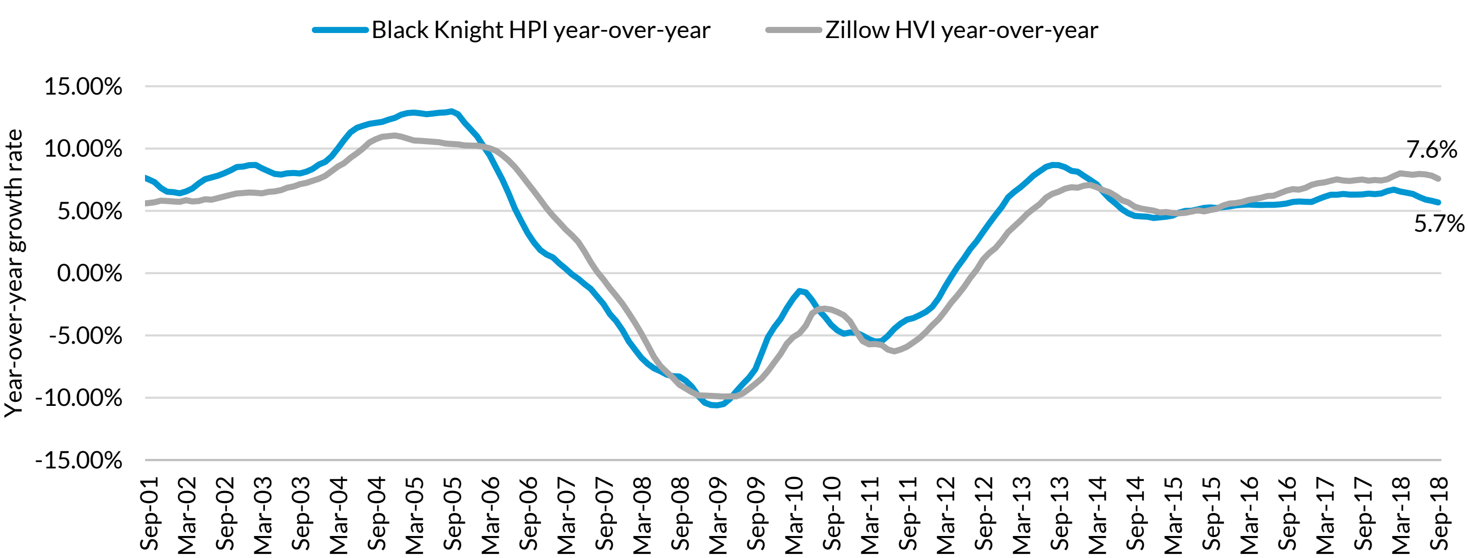
Serious delinquencies for single-family GSE loans, FHA loans, and VA loans continued to decline in Q3 2018 to levels equal to or lower than before the hurricane related uptick in Q4 2017. GSE delinquencies remain high relative to 2005-2007, while FHA and VA delinquencies (which are higher than their GSE counterparts) are at levels lower than 2005-2007. Home price changes turned positive in 2012. Year-over-year home price appreciation has slowed slightly in recent months, but remained robust in September 2018, standing at 5.7 percent, as measured by the Black Knight repeat sales index.

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 2018.*

National Year-Over-Year HPI Growth



Sources: *Black Knight, Zillow, and Urban Institute.* ***Note:*** *Data as of September 2018.*

State of the US Housing Market

Nationally, nominal home prices have improved by 49.1 percent since the trough, and have exceeded their pre-crisis peak valuation on a nominal basis by 11.1 percent. However, the picture is very different for different states, with many states well in excess of the prior peak, while a number of states remain more than 10% below peak levels: Maryland is 10.2% below, Nevada is 11.4% below, Florida is 11.9% below and Connecticut is 14.5% below.

	HPI Changes				
State	2000 to Peak	Peak to Trough	Trough to Current	YOY	Current HPI % Above Peak
National	75.8%	-25.5%	49.1%	5.7%	11.1%
Alabama	44.0%	-16.8%	26.4%	5.8%	5.1%
Alaska	69.6%	-3.1%	20.1%	1.9%	16.3%
Arizona	110.3%	-48.0%	73.5%	7.9%	-9.8%
Arkansas	42.0%	-10.5%	21.6%	3.9%	8.8%
California	155.6%	-43.0%	85.3%	5.8%	5.7%
Colorado	40.2%	-12.7%	72.6%	7.7%	50.7%
Connecticut	92.7%	-24.7%	13.4%	2.3%	-14.5%
Delaware	94.2%	-24.1%	25.0%	4.4%	-5.2%
District of Columbia	177.0%	-13.1%	51.3%	3.6%	31.4%
Florida	129.4%	-46.9%	66.0%	5.9%	-11.9%
Georgia	38.4%	-32.1%	59.0%	7.1%	8.0%
Hawaii	161.9%	-21.9%	47.4%	3.0%	15.1%
Idaho	71.1%	-28.4%	69.2%	12.9%	21.1%
Illinois	61.7%	-34.6%	37.1%	3.0%	-10.3%
Indiana	21.4%	-7.5%	30.0%	6.1%	20.3%
Iowa	28.4%	-5.0%	24.1%	4.3%	17.9%
Kansas	34.6%	-9.3%	37.8%	7.1%	24.9%
Kentucky	29.7%	-7.5%	30.9%	5.0%	21.1%
Louisiana	48.6%	-5.2%	21.2%	1.3%	14.9%
Maine	82.6%	-12.3%	31.6%	5.6%	15.4%
Maryland	129.3%	-28.3%	25.2%	3.4%	-10.2%
Massachusetts	92.9%	-22.9%	50.9%	6.2%	16.4%
Michigan	24.2%	-39.7%	70.4%	6.7%	2.8%
Minnesota	66.3%	-27.5%	50.0%	6.2%	8.7%
Mississippi	41.2%	-13.6%	22.5%	3.7%	5.8%
Missouri	42.8%	-14.6%	25.4%	4.1%	7.0%
Montana	81.9%	-10.4%	45.9%	5.6%	30.7%
Nebraska	26.4%	-6.6%	37.3%	6.1%	28.2%
Nevada	127.2%	-59.4%	118.3%	14.2%	-11.4%
New Hampshire	91.0%	-23.7%	36.6%	6.3%	4.3%
New Jersey	118.3%	-27.7%	25.0%	4.2%	-9.6%
New Mexico	66.9%	-16.2%	18.6%	3.8%	-0.6%
New York	99.0%	-15.2%	38.7%	6.3%	17.7%
North Carolina	40.4%	-15.4%	31.5%	6.2%	11.2%
North Dakota	53.7%	-4.1%	55.0%	2.5%	48.6%
Ohio	21.2%	-18.2%	30.8%	5.2%	6.9%
Oklahoma	37.5%	-2.3%	16.1%	2.2%	13.4%
Oregon	82.4%	-27.7%	72.2%	5.6%	24.5%
Pennsylvania	70.6%	-11.5%	21.3%	4.2%	7.4%
Rhode Island	131.8%	-34.4%	46.3%	6.7%	-3.9%
South Carolina	45.0%	-19.2%	30.7%	5.5%	5.6%
South Dakota	45.2%	-4.3%	39.7%	5.4%	33.8%
Tennessee	35.4%	-11.9%	37.7%	6.3%	21.3%
Texas	33.3%	-5.8%	47.4%	4.7%	38.9%
Utah	55.0%	-21.6%	66.3%	11.3%	30.5%
Vermont	82.6%	-7.7%	26.5%	6.5%	16.7%
Virginia	99.5%	-22.7%	23.2%	3.6%	-4.8%
Washington	85.6%	-28.5%	79.5%	8.9%	28.4%
West Virginia	43.1%	-6.8%	20.7%	2.6%	12.5%
Wisconsin	45.0%	-16.4%	31.8%	6.5%	10.2%
Wyoming	77.9%	-6.9%	25.0%	3.2%	16.4%

Sources: *Black Knight and Urban Institute.* ***Note:*** *HPI data as of September 2018. 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 09/2018, the latest HPI data period.*

State of the US Housing Market

Ginnie Mae loans constitute 30.2 percent of outstanding agency issuance by loan balance , 33.0 percent of the issuance over the past year. However, the Ginnie Mae share varies widely across states, with the share of outstandings (as measured by loan balance) as low as 16.1 percent in the District of Columbia and as high as 51.1 percent in Alaska. In general, the Ginnie Mae share is higher in states with lower home prices.

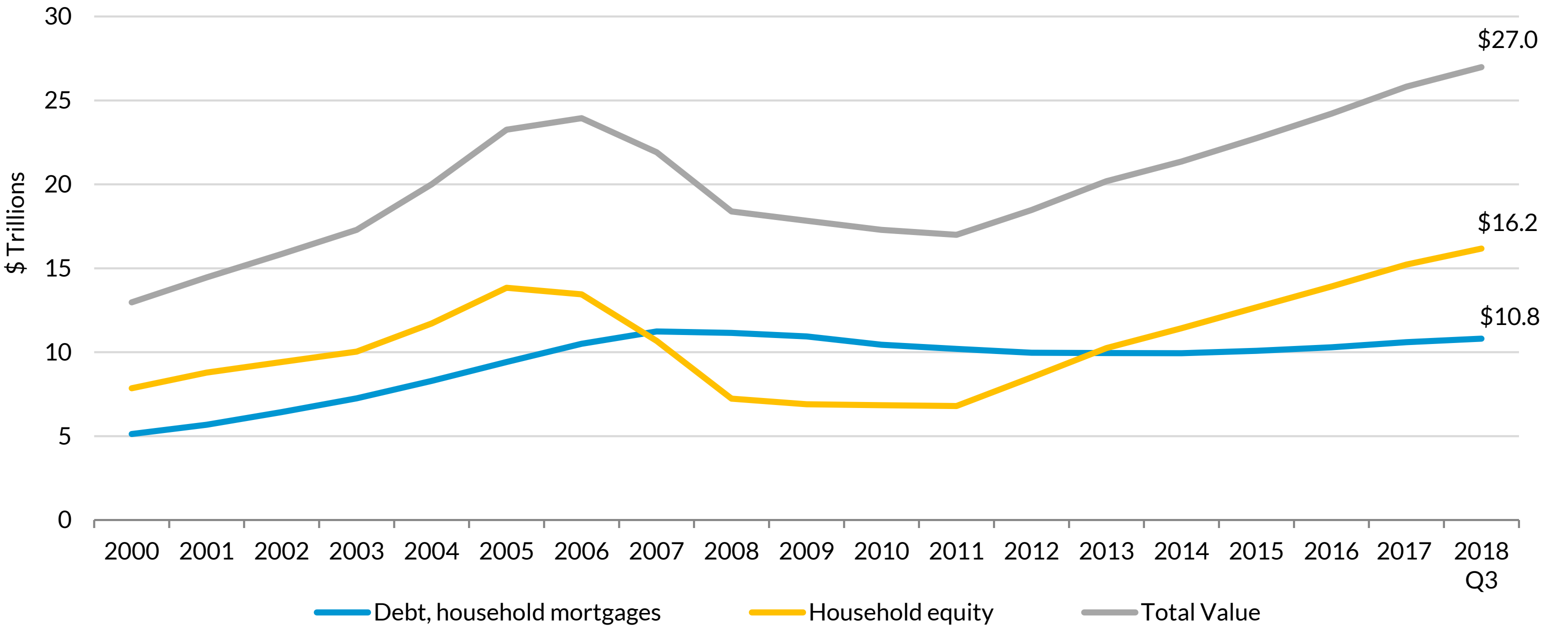
State	Agency Issuance (past 1 year)			Agency Outstanding		
	Ginnie Mae Share	Ginnie Mae Average Loan Size (Thousands)	GSE Average Loan Size (Thousands)	Ginnie Mae Share	Ginnie Mae Average Loan Size (Thousands)	GSE Average Loan Size (Thousands)
National	33.0%	215.5	231.6	30.2%	162.9	187.6
Alabama	44.1%	162.8	185.1	44.6%	127.4	151.2
Alaska	51.8%	285.0	247.3	51.1%	232.5	199.2
Arizona	32.5%	213.2	217.2	31.6%	163.6	176.5
Arkansas	43.7%	144.0	168.2	44.2%	109.7	136.8
California	26.9%	349.3	333.0	20.8%	266.7	267.2
Colorado	31.5%	288.9	277.6	27.1%	214.1	222.2
Connecticut	32.3%	215.5	227.7	29.0%	183.4	190.1
Delaware	38.2%	214.9	224.8	35.9%	180.2	184.4
District of Columbia	17.7%	413.8	357.4	16.1%	297.8	302.9
Florida	40.1%	210.4	209.0	34.1%	160.7	168.6
Georgia	40.0%	186.8	209.9	38.2%	140.7	168.4
Hawaii	38.1%	497.2	394.0	30.2%	389.0	315.1
Idaho	32.2%	202.1	206.4	31.8%	150.8	163.4
Illinois	26.5%	178.2	199.1	24.0%	140.6	161.4
Indiana	38.5%	143.1	158.8	37.4%	110.0	125.4
Iowa	26.8%	146.2	163.3	25.4%	113.1	131.5
Kansas	36.4%	156.1	176.4	35.0%	119.3	138.8
Kentucky	39.3%	151.2	167.3	38.5%	120.9	132.2
Louisiana	41.7%	170.5	194.5	41.4%	136.2	158.8
Maine	35.5%	186.3	201.8	31.9%	152.3	159.9
Maryland	43.7%	285.2	265.3	38.8%	231.5	219.4
Massachusetts	23.9%	294.1	284.2	18.9%	234.5	228.1
Michigan	25.5%	147.3	169.6	25.0%	112.4	134.3
Minnesota	24.3%	198.9	211.7	23.9%	155.0	170.1
Mississippi	49.8%	153.2	172.8	49.9%	118.8	141.5
Missouri	35.0%	152.5	173.7	34.4%	120.0	138.9
Montana	30.8%	218.9	221.7	29.4%	167.8	175.1
Nebraska	31.9%	164.2	172.1	32.8%	121.1	137.7
Nevada	34.6%	248.2	234.3	35.9%	183.9	187.5
New Hampshire	31.7%	235.8	226.8	28.7%	192.1	180.6
New Jersey	29.6%	251.1	266.5	27.0%	211.1	219.6
New Mexico	42.3%	180.8	188.9	42.2%	140.5	152.7
New York	26.7%	246.6	268.1	25.3%	185.0	213.6
North Carolina	34.0%	182.9	203.7	33.7%	140.0	165.3
North Dakota	29.1%	212.1	205.5	25.4%	165.8	166.2
Ohio	35.6%	143.8	156.7	35.8%	112.0	126.3
Oklahoma	45.7%	153.8	172.5	47.7%	117.8	139.6
Oregon	26.8%	258.4	260.7	23.3%	195.8	205.4
Pennsylvania	32.9%	167.9	194.3	32.3%	136.6	158.7
Rhode Island	38.1%	230.0	224.1	32.8%	185.4	182.1
South Carolina	39.3%	185.8	194.2	37.0%	145.3	159.8
South Dakota	36.6%	177.4	187.3	34.9%	141.8	149.2
Tennessee	40.0%	184.8	202.7	39.7%	136.6	162.5
Texas	34.8%	197.7	216.3	35.4%	138.9	173.7
Utah	28.8%	244.1	253.4	28.2%	187.5	204.0
Vermont	22.6%	192.7	199.0	19.5%	165.9	160.1
Virginia	44.9%	271.2	259.0	40.5%	222.2	217.0
Washington	29.8%	288.8	291.8	27.5%	215.4	226.0
West Virginia	48.5%	155.5	153.7	45.1%	126.0	127.5
Wisconsin	22.5%	167.6	177.3	20.5%	133.6	141.7
Wyoming	41.2%	213.6	213.8	39.5%	177.0	175.9

Sources: *eMBS and Urban Institute.* ***Note:*** *Ginnie Mae share are based on loan balance as of October 2018.*

State of the US Housing Market

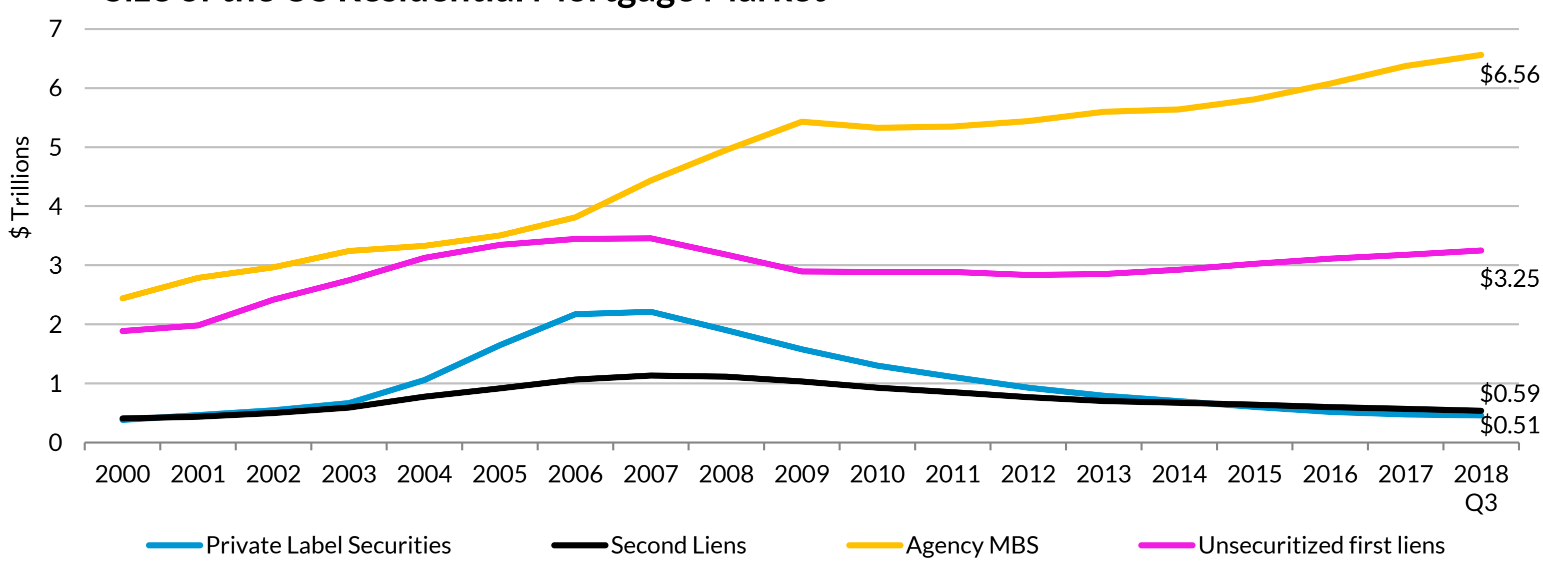
The Federal Reserve's Flow of Funds report has consistently indicated an increasing total value of the housing market driven by growing household equity since 2012, and 2018 Q3 was no different. Total debt and mortgages increased slightly to $10.8 trillion, and household equity reached a new high of $16.2 trillion, bringing the total value of the housing market to $27.0 trillion, 11 percent higher than the pre-crisis peak in 2006. Agency MBS make up 60.7 percent of the total mortgage market, private-label securities make up 4.2 percent, and unsecuritized first liens at the GSEs, commercial banks, savings institutions, and credit unions make up 30.1 percent. Second liens comprise the remaining 5.0 percent of the total.

Value of the US Housing Market



Sources: *Federal Reserve Flow of Funds and Urban Institute. Data as of Q3 2018.*

Size of the US Residential Mortgage Market

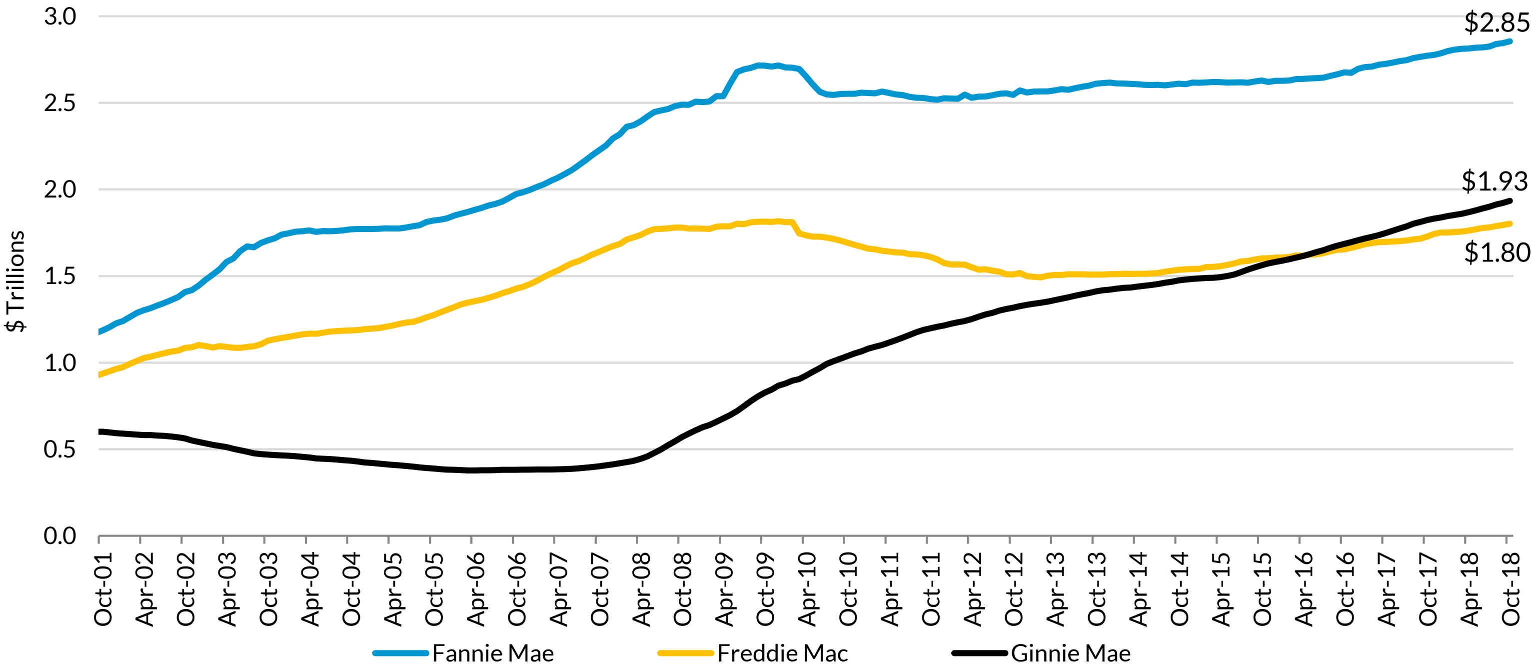


Sources: *Federal Reserve Flow of Funds, Inside Mortgage Finance, Fannie Mae, Freddie Mac, eMBS and Urban Institute.*
Note: *Unsecuritized first liens includes loans held by commercial banks, GSEs, savings institutions, and credit unions. Data as of Q3 2018.*

State of the US Housing Market

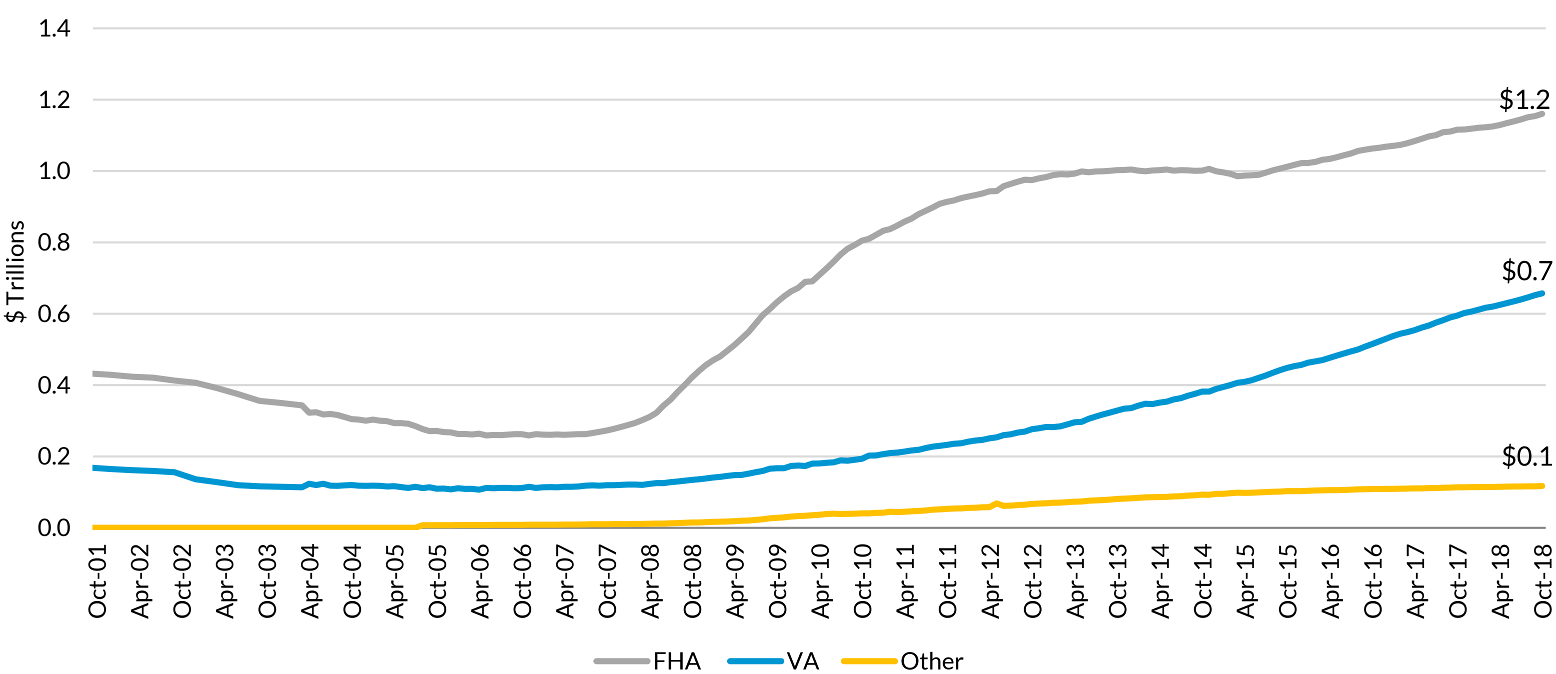
As of October 2018, outstanding securities in the agency market totaled $6.59 trillion and were 43.3 percent Fannie Mae, 27.3 percent Freddie Mac, and 29.3 percent Ginnie Mae. Ginnie Mae has more outstandings than Freddie Mac. Within the Ginnie Mae market, VA has been growing very rapidly, and now comprises 34.0 percent of total Ginnie Mae outstandings.

Outstanding Agency Mortgage-Backed Securities



Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Outstanding Ginnie Mae Mortgage-Backed Securities

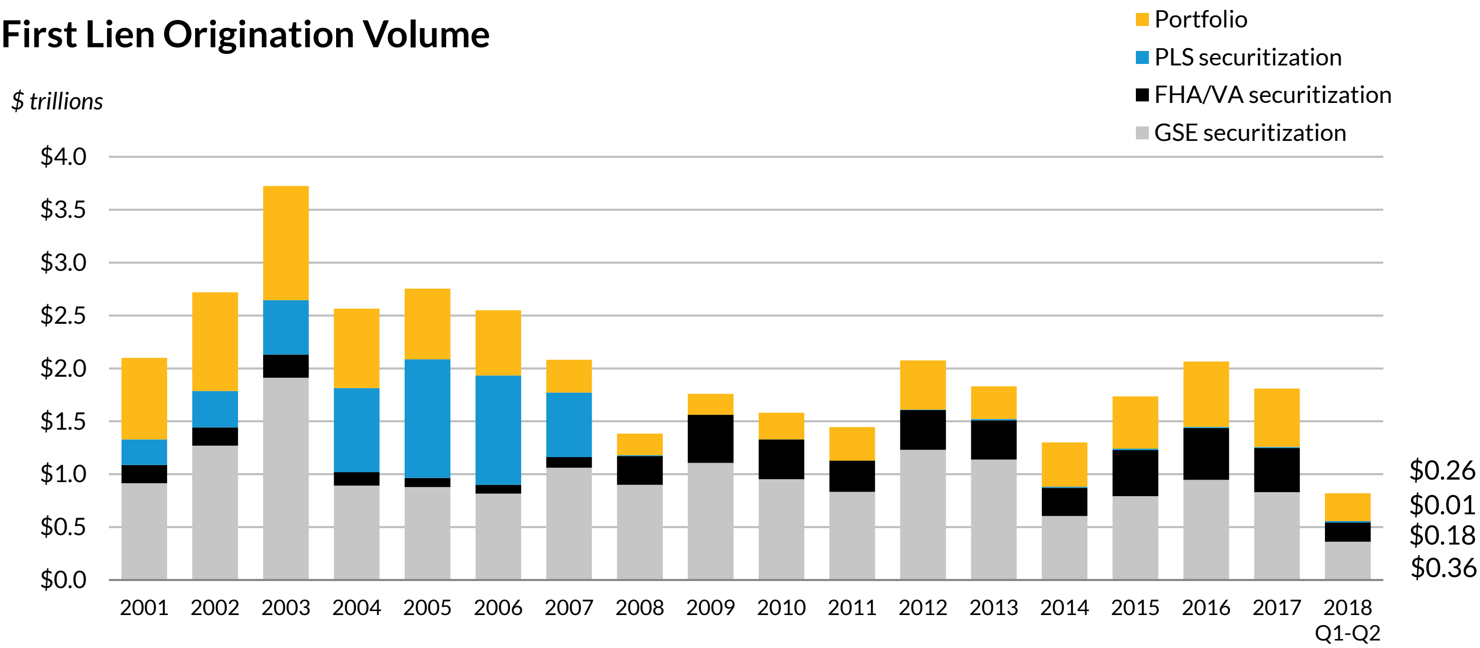


Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

State of the US Housing Market

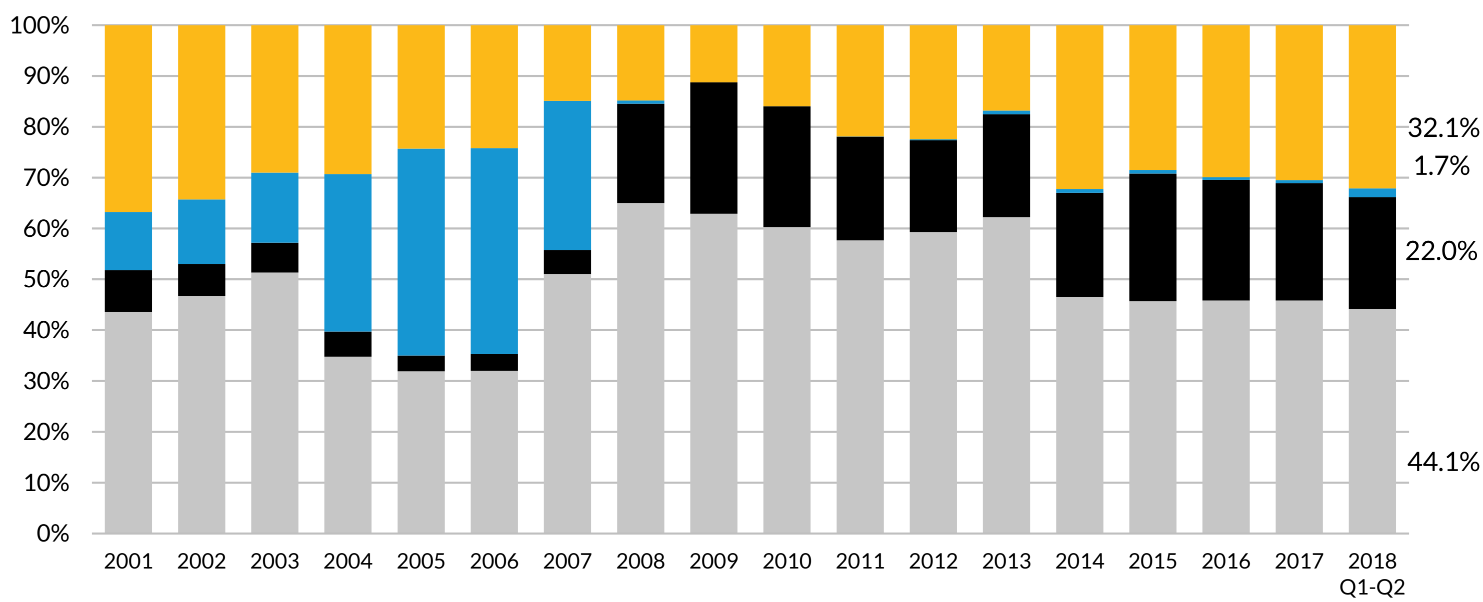
First lien originations totaled $820 billion in the first half of 2018, down slightly from the first half of 2017, mostly due to higher interest rates. The share of portfolio originations was 32 percent in the first half of 2018, up from 30 percent in 2017. The GSE share was around 44 percent, down from 46 percent in 2017. The FHA/VA share was slightly down: 22 percent for H1 2018 versus 23 percent in 2017. Origination of private-label securities increased from 0.6 percent to 1.7 percent from 2017 to H1 2018.

First Lien Origination Volume



Sources: *Inside Mortgage Finance and Urban Institute.* **Note:** *Data as of Q2 2018.*

First Lien Origination Share



Sources: *Inside Mortgage Finance and Urban Institute.* **Note:** *Data as of Q2 2018.*

US Agency Market, Originations

Agency gross issuance totaled $1.007 trillion in the first ten months of 2018, down 8.7 percent compared to the same time period in 2017. Ginnie Mae gross issuance was down by 11.2 percent and GSE gross issuance was down by 7.4 percent. Within the Ginnie Mae market, FHA is down by 13.7 percent and VA origination is down by 7.0 percent. The decline in origination volume is the result of higher interest rates.

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 YTD	$409.1	$259.0	$668.1	$339.0	$1,007.1
2018 % Change YOY	-7.6%	-7.1%	-7.4%	-11.2%	-8.7%
2018 Ann.	$490.9	$310.7	$801.7	$406.8	$1,208.5

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 YTD	$188.6	$135.9	$14.6	$339.0
2018 % Change YOY	-13.7%	-7.0%	-14.5%	-11.2%
2018 Ann.	$226.3	$163.0	$17.5	$406.8

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 2018.*

US Agency Market, Originations

Agency net issuance totaled $215.3 billion in the first ten months of 2018, down 13.4 percent compared to the same period in 2017. Ginnie Mae net issuance was $95.5 billion, comprising 44.3 percent of total agency net issuance. Note that Ginnie Mae net issuance in the first ten months of 2018 is down 17.9 percent year over year. Ginnie Mae net issuance YTD in 2018 is comprised of 53.8 percent VA, 42.9 percent FHA and 3.2 percent other issuance.

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 YTD	$68.6	$51.2	$119.8	$95.5	$215.3
2018 % Change YOY	-9.7%	-9.4%	-9.6%	-17.9%	-13.4%
2018 Ann.	$82.4	$61.4	$143.8	$114.6	$258.3

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 YTD	$41.0	$51.4	$3.1	$95.5
2018 % Change YOY	-14.5%	-19.7%	-27.6%	-17.9%
2018 Ann.	$49.2	$61.6	$3.7	$114.6

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 2018.*

US Agency Market, Originations

Agency gross issuance has been generally declining, but the seasonal trend is very strong. This table allows for a comparison with the same month in previous years. October 2018 levels of $100.3 billion are below the October 2017 level of $115.9 billion.

Monthly Agency Issuance

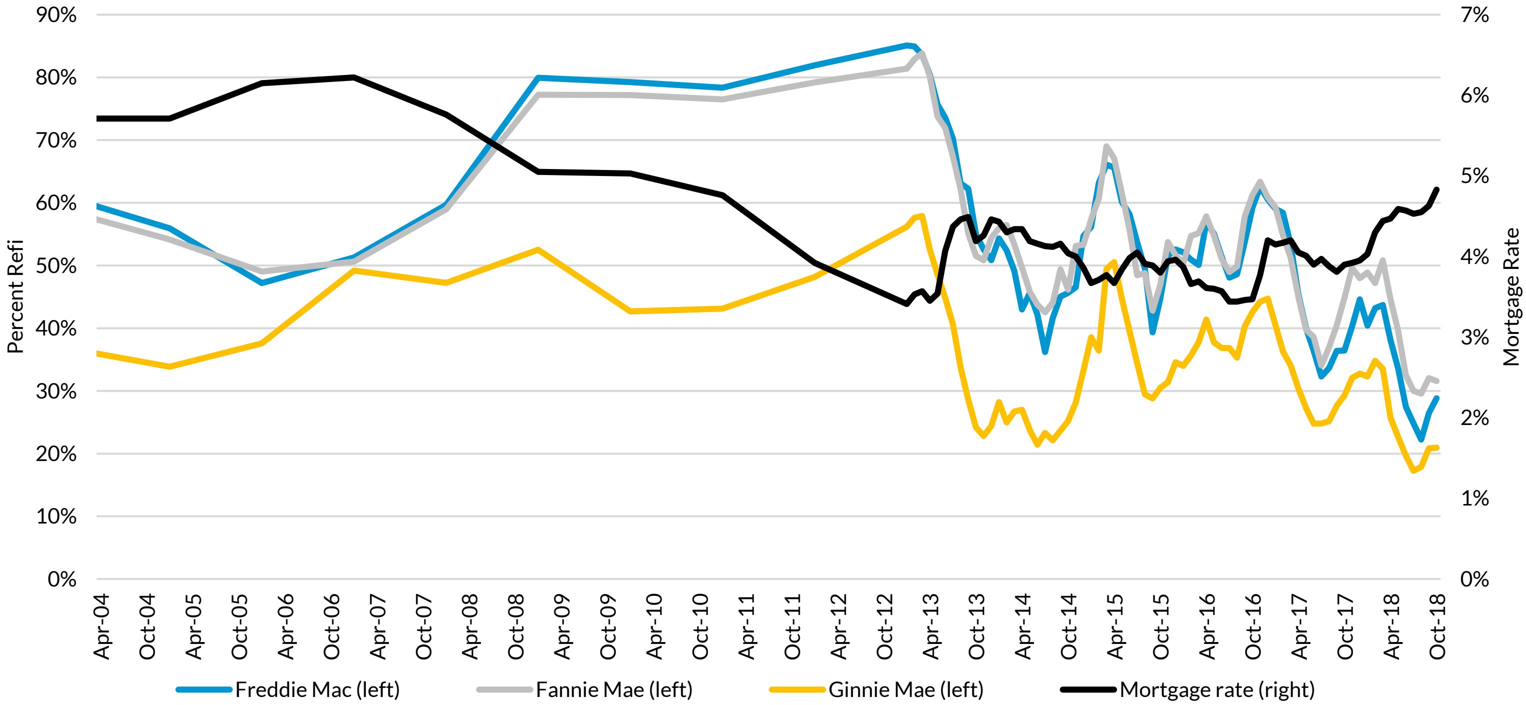
	Gross Issuance				Net Issuance			
Date	Fannie Mae	Freddie Mac	Ginnie Mae	Total	Fannie Mae	Freddie Mac	Ginnie Mae	Total
Jan-16	$35.6	$22.5	$32.5	$90.6	-$0.6	$1.0	$7.3	$7.8
Feb-16	$32.4	$21.2	$30.5	$84.1	$2.4	$3.1	$8.4	$13.9
Mar-16	$39.7	$27.5	$32.9	$100.1	$7.9	$8.2	$9.6	$25.8
Apr-16	$43.8	$26.2	$40.1	$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	$12.8	$20.6
Feb-18	$40.3	$21.5	$31.9	$93.7	$8.0	$2.3	$10.2	$17.4
Mar-18	$35.6	$21.3	$29.0	$85.9	$4.9	$3.0	$7.9	$14.0
Apr-18	$36.3	$26.2	$32.7	$95.2	$1.7	$6.1	$7.8	$16.8
May-18	$38.9	$27.5	$33.7	$100.1	$4.5	$7.2	$11.8	$22.4
Jun-18	$38.2	$28.8	$35.6	$102.5	$2.2	$6.8	$9.0	$19.5
Jul-18	$40.3	$26.2	$35.6	$102.1	$4.2	$3.7	$7.9	$18.6
Aug-18	$50.6	$29.6	$37.5	$117.6	$14.9	$7.9	$22.8	$35.6
Sep-18	$41.8	$29.2	$34.8	$105.8	$5.7	$6.2	$11.9	$21.0
Oct-18	$39.8	$27.3	$33.2	$100.3	$10.1	$7.6	$17.6	$29.3

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 2018.*

US Agency Market, Originations

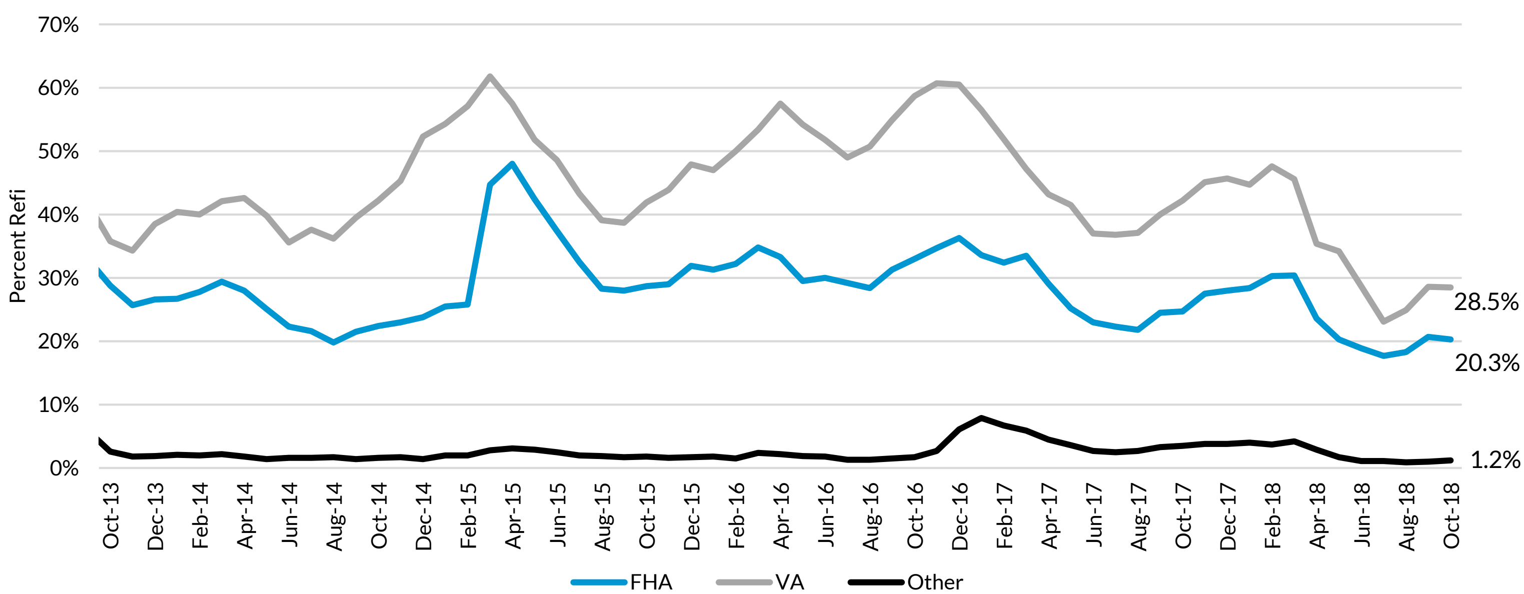
The Ginnie Mae refi share stood at 21 percent in October 2018, below the 32 and 29 percent shares for Fannie Mae and Freddie Mac, respectively. Within Ginnie Mae, VA had the highest refi share at 29 percent in October 2018, followed by FHA's 20 percent refi share. During the spring and summer months, the refi share for all agencies had been failing sharply, due to rising interest rates and seasonal upticks in purchase activity. With the end of the summer surge in purchase activity, the refi share the past few months is stable to increasing slightly.

Percent Refi at Issuance



Sources*: eMBS and Urban Institute.* **Note***: Based on at-issuance balance. Data as of October 2018.*

Percent Refi at Issuance: Ginnie Mae Breakdown

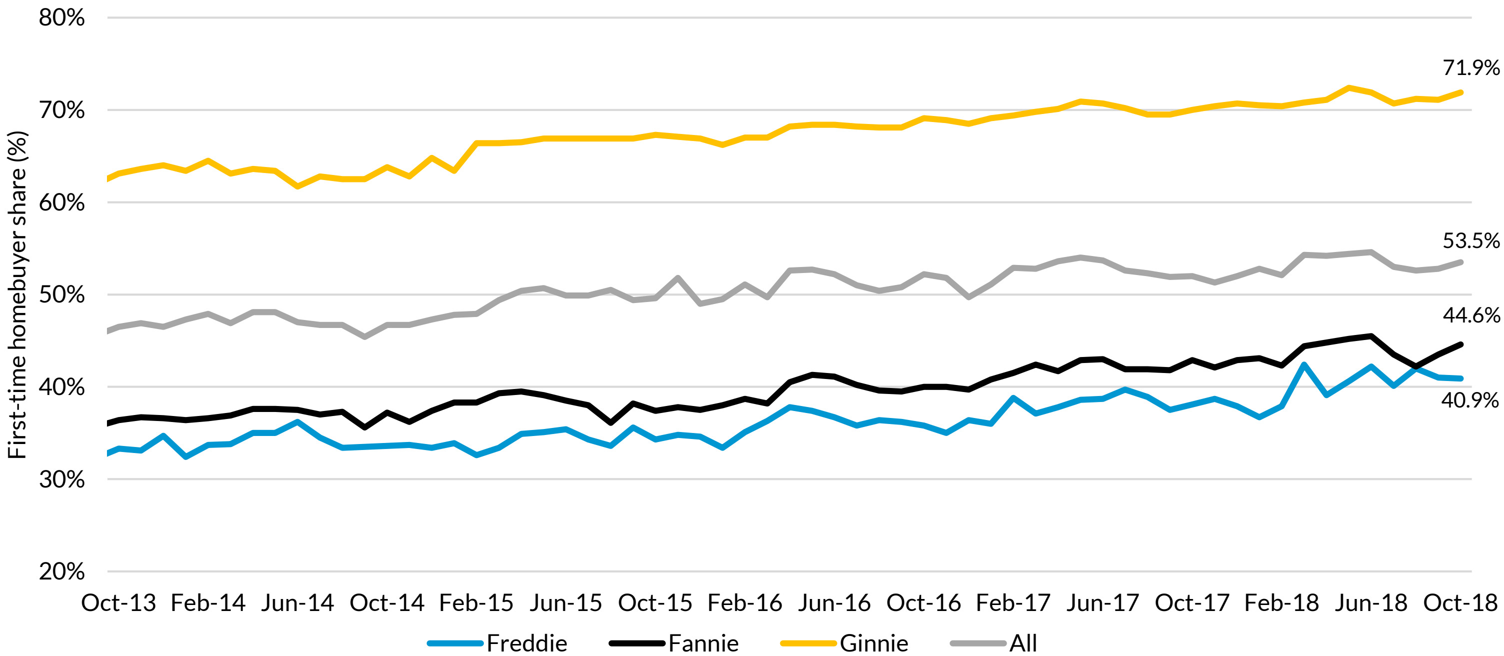


Sources*: eMBS and Urban Institute.*
Note*: Based on at-issuance balance. "Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2018.*

Credit Box

The first time homebuyer share of Ginnie Mae purchase loans remained relatively constant at 71.9 percent in October 2018, below the historical high reached in May 2018. 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 44.6 percent and 40.9 percent of Fannie and Freddie purchase originations, respectively. The bottom table shows that based on mortgages originated in October 2018, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan and have a lower credit score, a much higher LTV and a similar DTI, thus requiring a higher interest rate.

First Time Homebuyer Share: Purchase Only Loans



Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2018.*

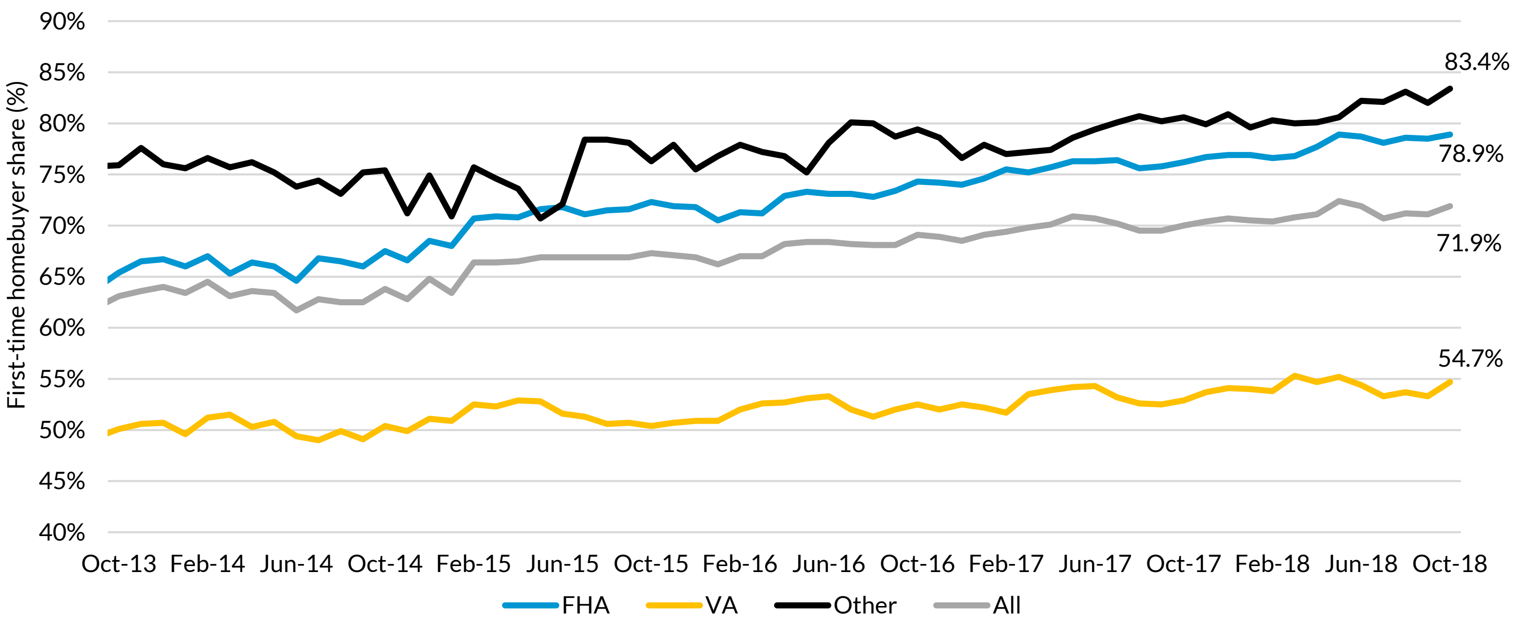
	Fannie Mae		Freddie Mac		Ginnie Mae		All	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount ($)	231,867	258,761	233,882	253,886	210,084	258,024	221,724	257,022
Credit Score	735.9	752.9	739.4	752.1	679.5	702.2	709.3	739.4
LTV (%)	88.4	79.3	87.0	79.2	96.9	95.3	92.2	83.5
DTI (%)	36.9	37.2	36.2	36.7	42.0	43.0	39.2	38.6
Loan Rate (%)	4.9	4.7	4.8	4.8	4.9	4.7	4.9	4.7

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 2018.*

Credit Box

Within the Ginnie Mae purchase market, 78.9 percent of FHA loans, 54.7 percent of VA loans and 83.4 percent of other loans represent financing for first time home buyers in October 2018. The bottom table shows that based on mortgages originated in October 2018, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan and have a lower credit score, and similar LTVs and DTIs, thus requiring a higher interest rate.

First Time Homebuyer Share: Ginnie Mae Purchase Only Loans Breakdown by Source



Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2018.*

	FHA		VA		Other		Ginnie Mae Total	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount ($)	206,855	226,296	247,457	297,582	145,247	160,798	210,084	258,024
Credit Score	669.9	674.2	699.8	728.0	695.7	701.9	679.5	702.2
LTV (%)	95.5	94.0	99.8	96.1	99.2	99.3	96.9	95.3
DTI (%)	43.3	44.4	41.2	42.4	35.1	35.8	42.0	43.0
Loan Rate (%)	4.9	4.9	4.7	4.6	4.8	4.8	4.9	4.7

Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018. "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.*

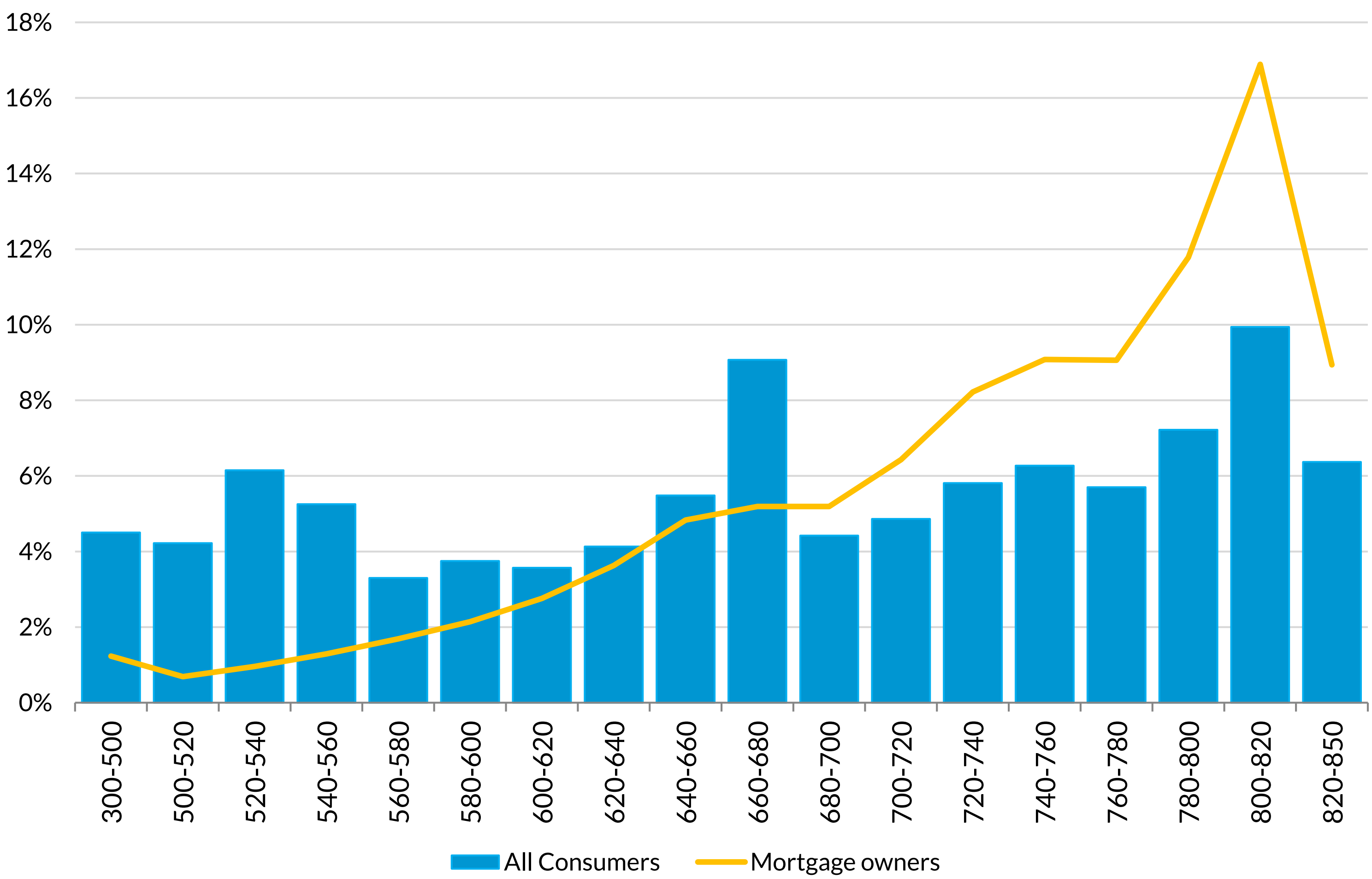
Credit Box

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 2018 Credit Box at a Glance

In October 2018, the median Ginnie Mae FICO score was 676 versus 747 for Fannie and 749 for Freddie. Note that the FICO score for the 10th percentile was 620 for Ginnie Mae, versus 670 for Fannie and 673 for Freddie. Within the Ginnie Mae market, FHA loans have a median FICO score of 664, VA loans have a median FICO score of 706 and other loans have a median FICO score of 693.

Purchase FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	296,635	643	681	731	775	797	725
Fannie	113,451	681	714	754	785	801	746
Freddie	76,544	684	717	756	786	801	748
Ginnie	106,640	622	645	677	724	770	686
Refi FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	117,038	638	673	717	762	791	715
Fannie	52,012	656	689	730	771	795	728
Freddie	36,020	656	690	733	771	795	728
Ginnie	29,006	607	638	673	713	756	676
All FICO							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	413,673	642	678	727	772	796	722
Fannie	165,463	670	705	747	781	800	740
Freddie	112,564	673	708	749	782	800	742
Ginnie	135,646	620	643	676	721	767	684

Purchase FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	106,640	622	645	677	724	770	686
FHA	64,715	616	638	665	699	738	671
VA	32,655	631	663	713	765	793	713
Other	9,270	638	659	693	733	765	697
Refi FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	29,006	607	638	673	713	756	676
FHA	16,040	598	628	659	692	727	661
VA	12,866	623	655	694	738	776	695
Other	100	613	657	699	761	800	701
All FICO: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	135,646	620	643	676	721	767	684
FHA	80,755	612	636	664	698	736	669
VA	45,521	629	661	706	758	790	708
Other	9,370	638	659	693	733	766	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 2018.*

October 2018 Credit Box at a Glance

In October 2018, the median loan-to-value ratio (LTV) was 96.5 percent for Ginnie Mae, and 80 percent for both Fannie Mae and Freddie Mac. The 90th percentile was 101 percent for Ginnie Mae, and 95-97 percent for Fannie Mae and Freddie Mac. Within the Ginnie Mae market, the median LTV was 96.5 for FHA, 100.0 for VA and 101.0 for other programs.

Purchase LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	296,787	71.0	80.0	95.0	96.5	100.0	87.5
Fannie	113,302	64.0	80.0	85.0	95.0	97.0	83.0
Freddie	76,604	62.0	79.0	80.0	95.0	95.0	81.8
Ginnie	106,881	92.7	96.5	96.5	100.0	102.0	96.4
Refi LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	117,289	44.0	60.0	74.0	80.0	90.0	70.2
Fannie	52,014	40.0	55.0	69.0	78.0	80.0	64.7
Freddie	36,042	42.0	57.0	70.0	80.0	80.0	66.4
Ginnie	29,233	67.0	80.0	86.5	95.3	100.0	84.7
All LTV							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	414,076	58.0	75.0	86.5	96.5	98.2	82.6
Fannie	165,316	52.0	70.0	80.0	93.0	97.0	77.2
Freddie	112,646	52.0	70.0	80.0	90.0	95.0	76.9
Ginnie	136,114	83.5	94.3	96.5	100.0	101.0	93.9

Purchase LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	106,881	92.7	96.5	96.5	100.0	102.0	96.4
FHA	64,866	93.1	96.5	96.5	96.5	96.5	95.2
VA	32,704	90.9	100.0	100.0	102.2	103.3	98.1
Other	9,311	95.0	99.0	101.0	101.0	102.0	99.2
Refi LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	29,233	67.0	80.0	86.5	95.3	100.0	84.7
FHA	16,167	65.1	78.2	86.0	86.5	91.0	81.0
VA	12,951	69.7	83.5	94.2	100.0	100.7	89.4
Other	115	63.2	73.3	85.0	91.7	99.2	81.3
All LTV: Ginnie Mae Breakdown By Source							
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	136,114	83.5	94.3	96.5	100.0	101.0	93.9
FHA	81,033	83.2	91.6	96.5	96.5	96.5	92.4
VA	45,655	81.8	95.0	100.0	101.1	103.3	95.7
Other	9,426	94.6	99.0	101.0	101.0	102.0	99.0

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 2018.*

October 2018 Credit Box at a Glance

In October 2018, the median Ginnie Mae debt-to-income ratio (DTI) was 43.0 percent, considerably higher than the 38-39 percent median DTIs for Fannie Mae and Freddie Mac. The 90th percentile for Ginnie Mae was 54.4 percent, also much higher than the 48 percent DTI for the GSEs. Within the Ginnie Mae market, the median FHA DTI ratio was 44.6 percent, versus 42.4 percent for VA and 36.2 percent for other lending programs.

Purchase DTI

	Number of Loans	P10	P25	Median	P75	P90	Mean
All	296,624	25.0	32.0	40.0	46.0	50.0	38.7
Fannie	113,563	24.0	30.0	38.0	44.0	48.0	36.9
Freddie	76,541	23.0	30.0	38.0	44.0	48.0	36.3
Ginnie	106,520	29.2	35.9	43.0	49.5	54.4	42.3

Refi DTI

	Number of Loans	P10	P25	Median	P75	P90	Mean
All	114,534	24.0	31.0	40.0	46.0	49.5	38.1
Fannie	51,569	23.0	31.0	39.0	46.0	49.0	37.6
Freddie	35,613	22.0	29.0	37.0	43.0	47.0	35.9
Ginnie	27,352	27.9	35.3	43.3	49.6	54.3	42.0

All DTI

	Number of Loans	P10	P25	Median	P75	P90	Mean
All	411,158	25.0	32.0	40.0	46.0	50.0	38.5
Fannie	165,132	23.0	31.0	39.0	45.0	48.0	37.1
Freddie	112,154	23.0	30.0	38.0	44.0	48.0	36.2
Ginnie	133,872	29.0	35.8	43.0	49.5	54.4	42.2

Purchase DTI: Ginnie Mae Breakdown By Source

	Number of Loans	P10	P25	Median	P75	P90	Mean
All	106,520	29.2	35.9	43.0	49.5	54.4	42.3
FHA	64,845	30.9	37.8	44.7	50.5	54.7	43.5
VA	32,439	27.9	35.0	42.4	49.1	54.4	41.7
Other	9,236	26.2	31.1	36.2	40.1	42.9	35.2

Refi DTI: Ginnie Mae Breakdown By Source

	Number of Loans	P10	P25	Median	P75	P90	Mean
All	27,352	27.9	35.3	43.3	49.6	54.3	42.0
FHA	15,162	28.5	36.1	44.0	49.8	54.4	42.5
VA	12,121	27.2	34.5	42.4	49.1	54.2	41.5
Other	69	20.4	26.9	36.3	40.1	43.9	33.5

All DTI: Ginnie Mae Breakdown By Source

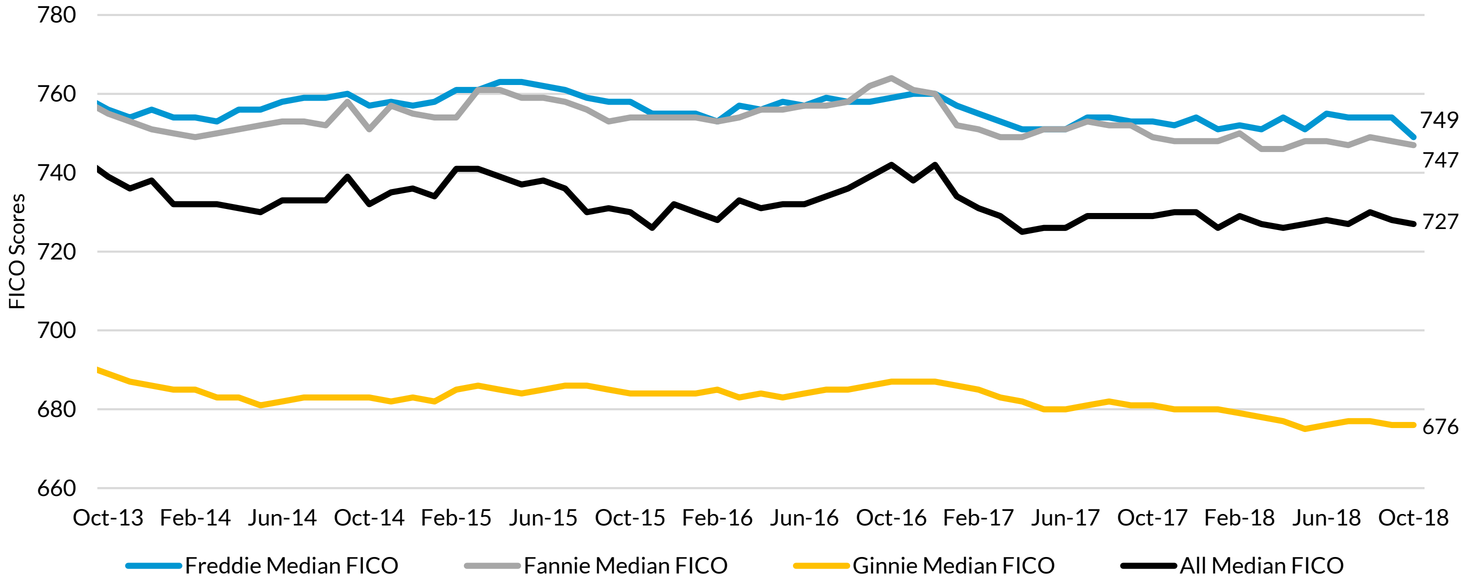
	Number of Loans	P10	P25	Median	P75	P90	Mean
All	133,872	29.0	35.8	43.0	49.5	54.4	42.2
FHA	80,007	30.4	37.5	44.6	50.3	54.7	43.3
VA	44,560	27.7	34.8	42.4	49.1	54.4	41.7
Other	9,305	26.1	31.0	36.2	40.1	42.9	35.2

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 2018.*

Credit Box: Historical

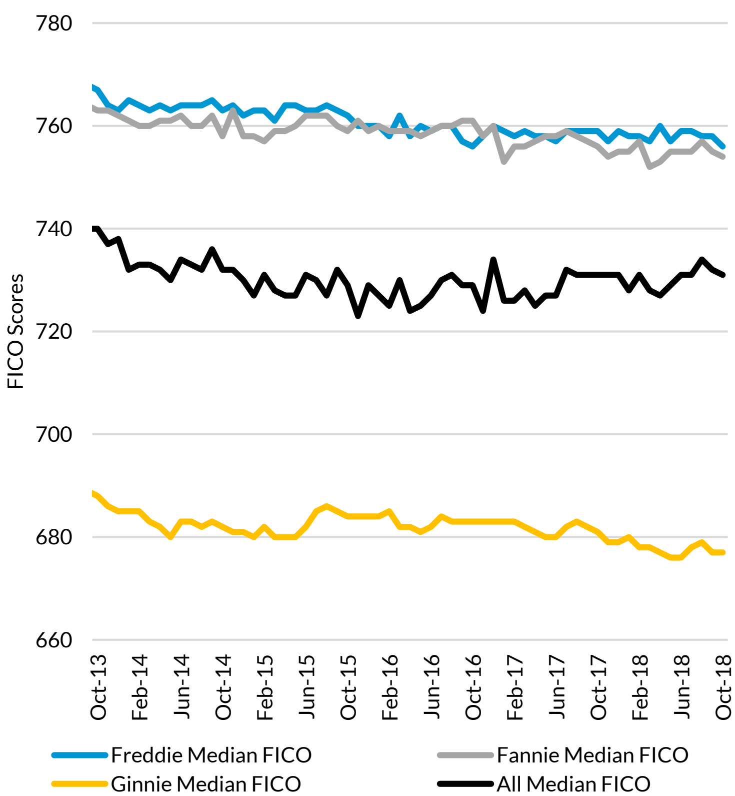
The median FICO score for all agency MBS originated in October was 727, slightly lower than in September. The figures show that the median FICO score for Ginnie Mae borrowers has always been considerably lower than for GSE borrowers. The difference between Ginnie Mae and GSE borrowers is wider in purchase loans than in refi loans.

FICO Scores for All Loans



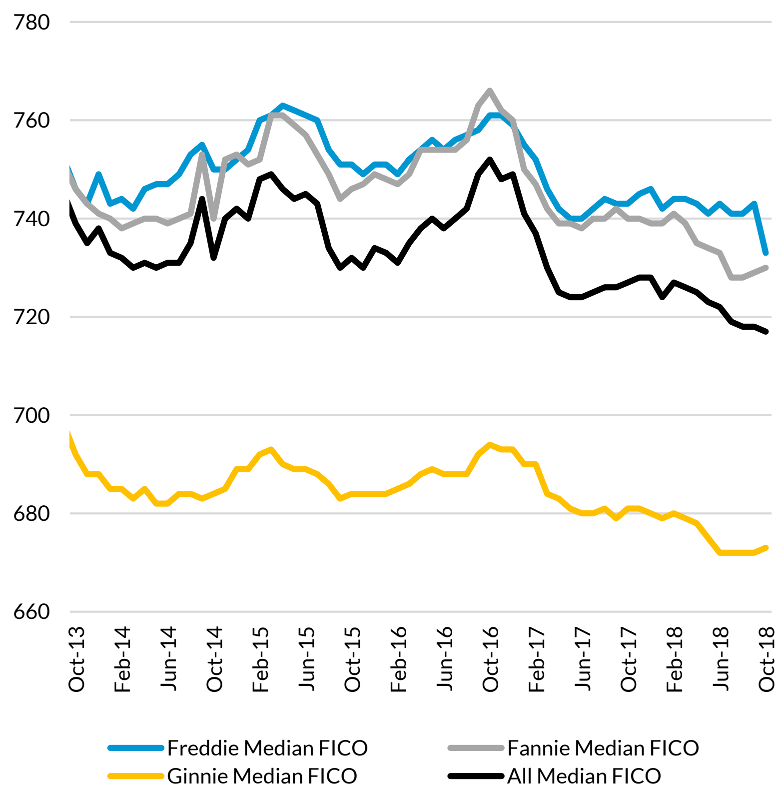
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2018.*

FICO Scores for Purchase Loans



Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

FICO Scores for Refinance Loans

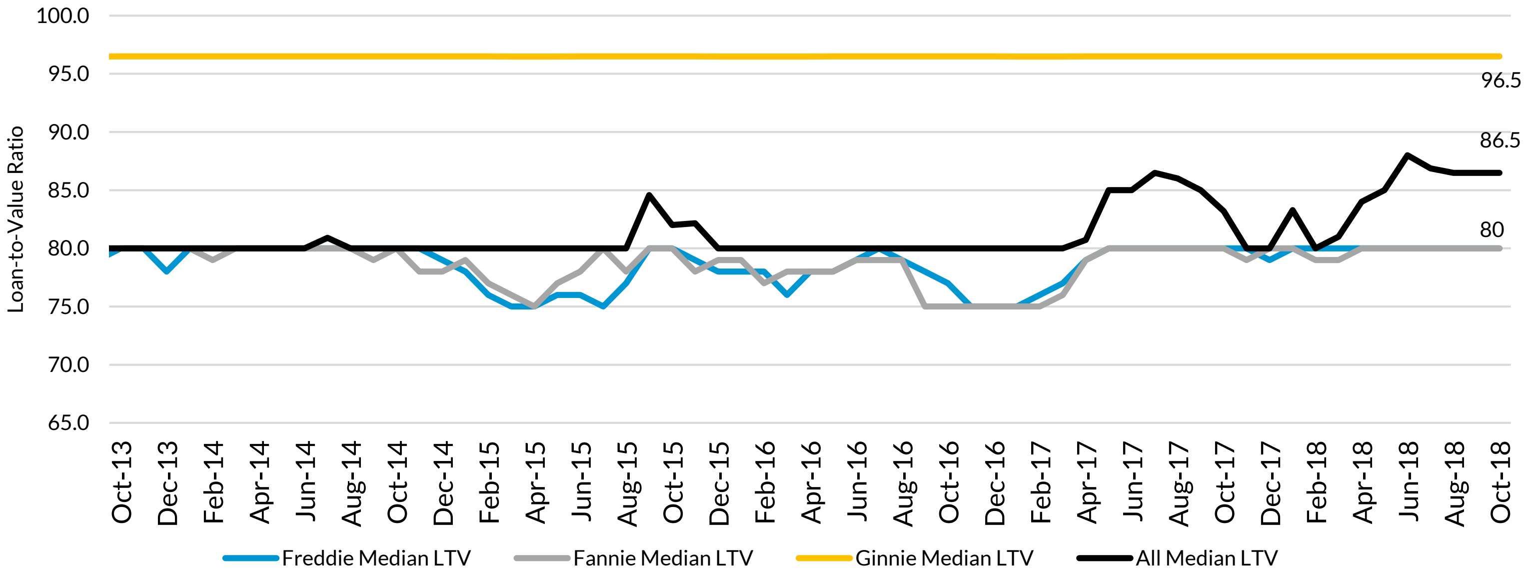


Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

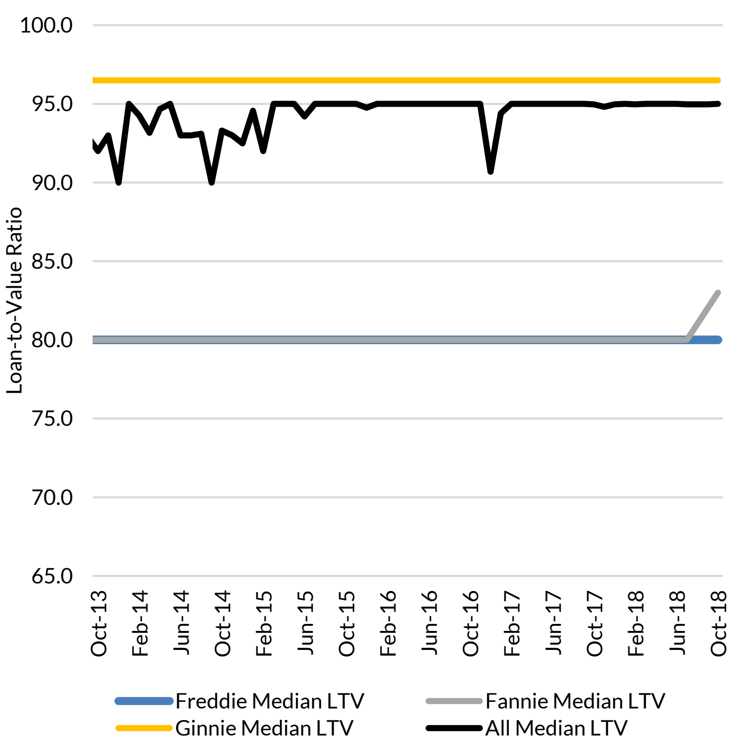
Credit Box: Historical

Median LTVs for Ginnie Mae loans have historically been at 96.5 percent, much higher than the 80 percent LTVs for the GSEs. Through time, both Ginnie Mae and GSE refinances have LTVs about 6-12 points lower than their purchase counterparts.

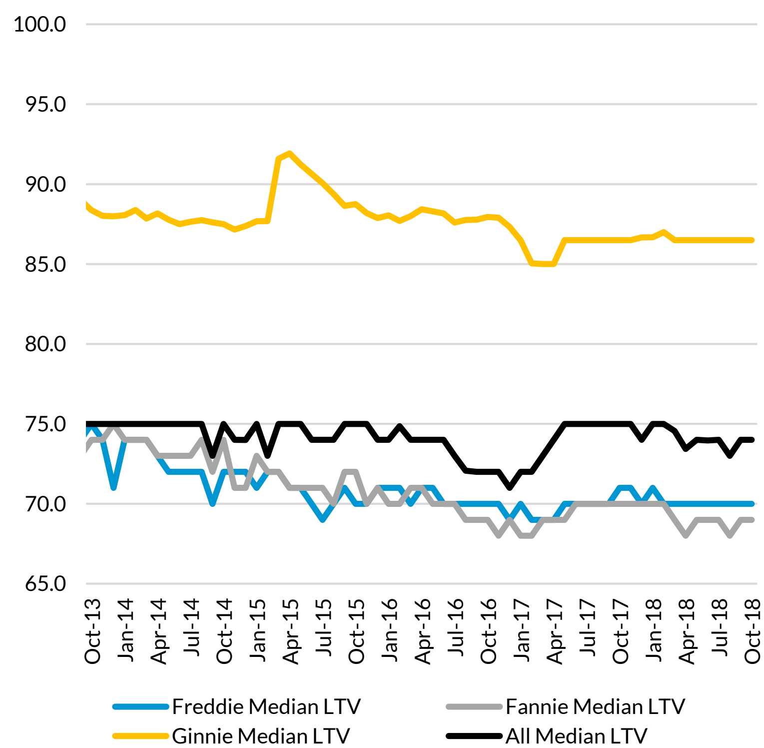
LTV Ratio for All Loans



LTV Ratio for Purchase Loans



LTV Ratio for Refinance Loans

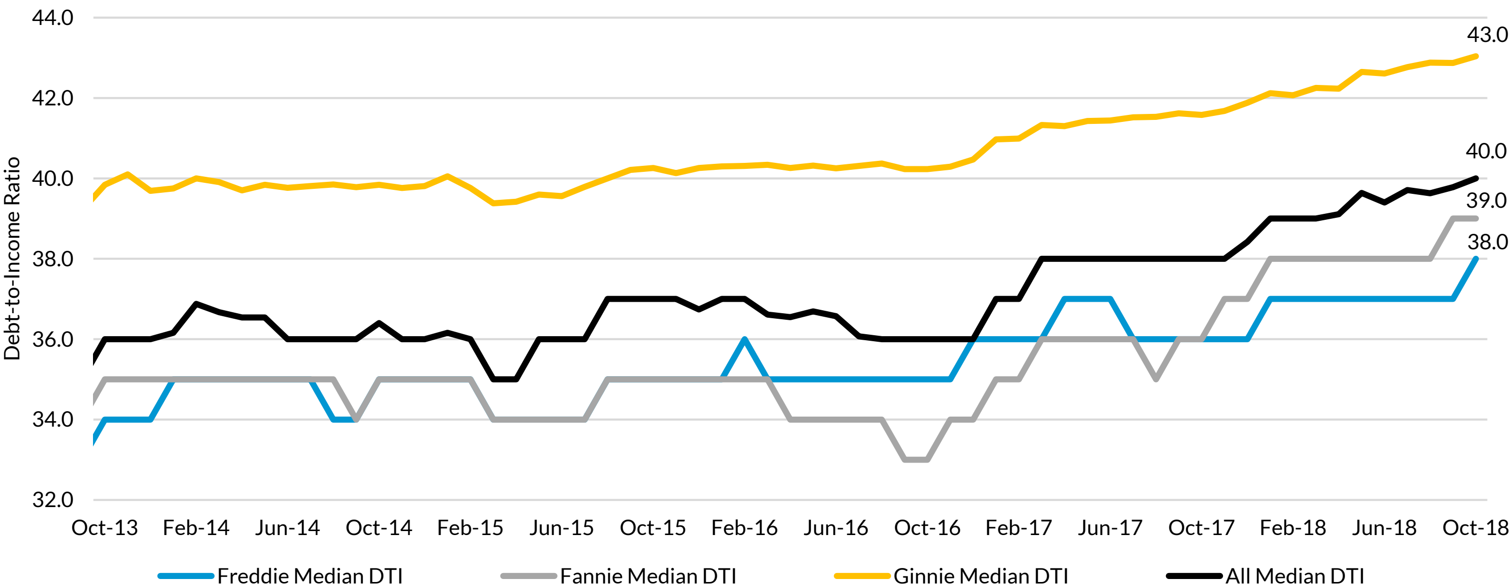


Sources: *eMBS and Urban Institute.* **Note:** *In May 2017 Ginnie Mae began disclosing issuer-reported LTV for FHA loans, which includes the financed upfront mortgage insurance premium. To make it consistent with the previously reported LTV, we removed the financed upfront mortgage insurance premium by subtracting 169 bps from this new issuer-reported LTV. Sources and note apply to all three graphs. Data as of October 2018.*

Credit Box: Historical

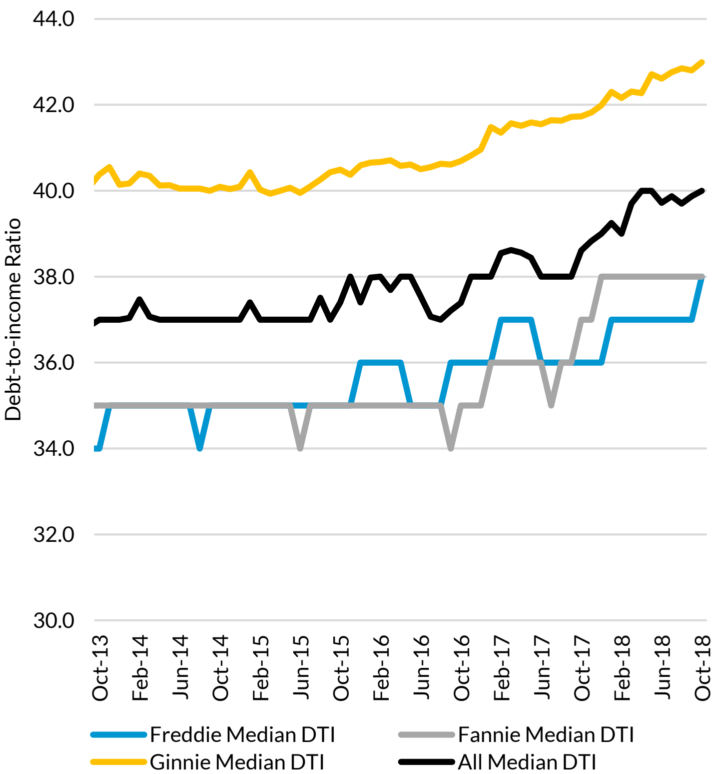
Median debt-to-income ratios on Ginnie Mae loans have historically been in the low 40s, considerably higher than that of the GSEs. DTIs have been inching up over the past eighteen months for both Ginnie Mae and GSE loans, with the movement more pronounced for Ginnie Mae loans. Increases in DTIs are very typical in the current environment of rising interest rates and home prices, as borrowers are left with sharply higher monthly payments.

DTI Ratio for All Loans



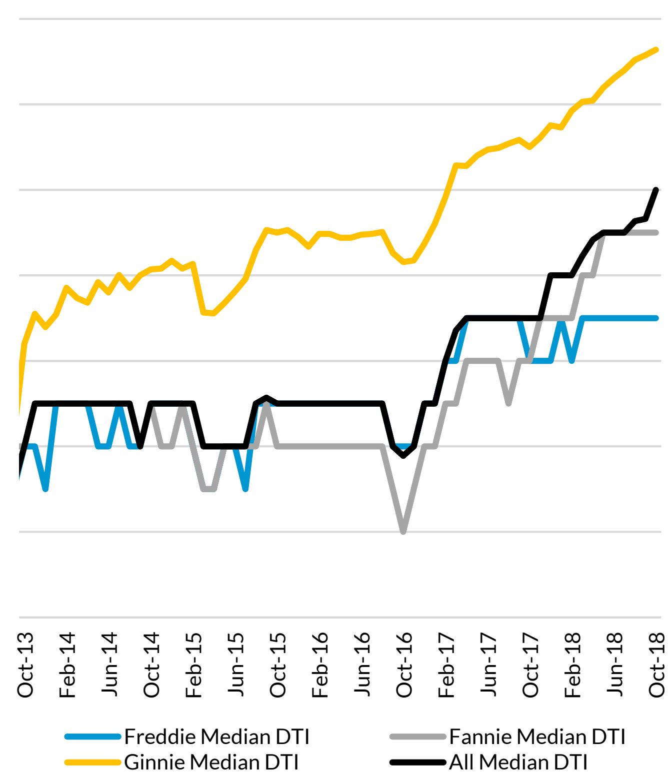
Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

DTI Ratio for Purchase Loans



Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2018.*

DTI Ratio for Refinance Loans

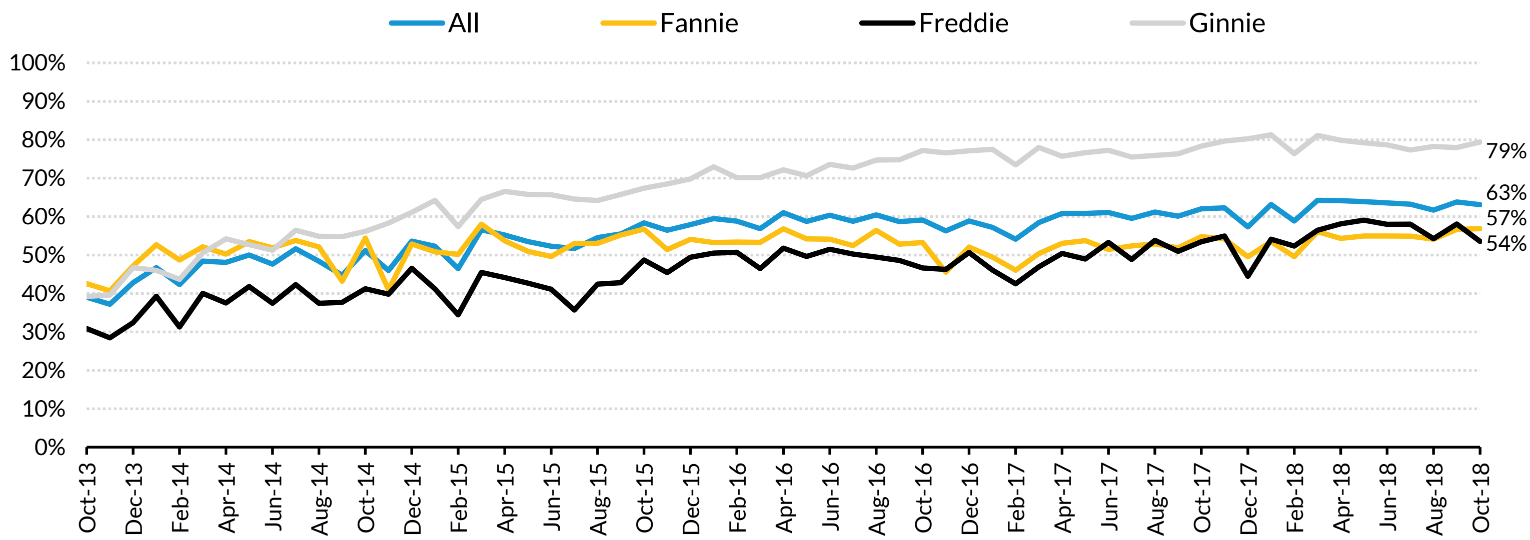


Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2018.*

Nonbank Originators

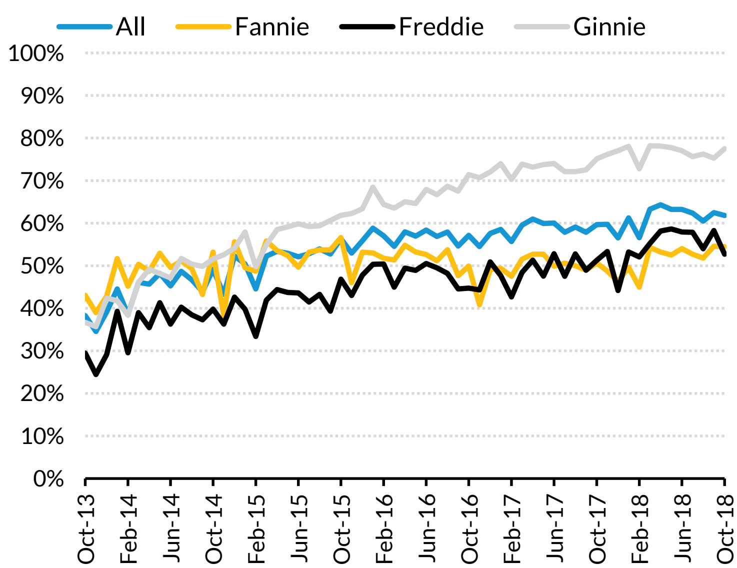
The nonbank origination share has been generally increasing since 2013. In October 2018, the Ginnie Mae nonbank originator share stood at 79 percent, considerably higher than the GSEs' 54-57 percent nonbank origination share. For Ginnie Mae, the nonbank share for refis was higher than the nonbank share for purchases. The differences were more modest for the GSEs.

Nonbank Origination Share: All Loans

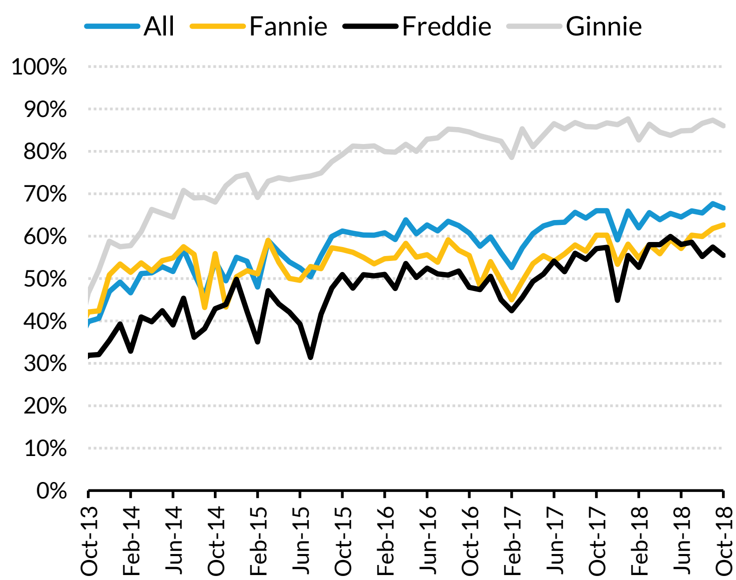


Sources: *eMBS and Urban Institute*
Note: *Data as of October 2018.*

Nonbank Origination Share: Purchase Loans



Nonbank Origination Share: Refinance Loans

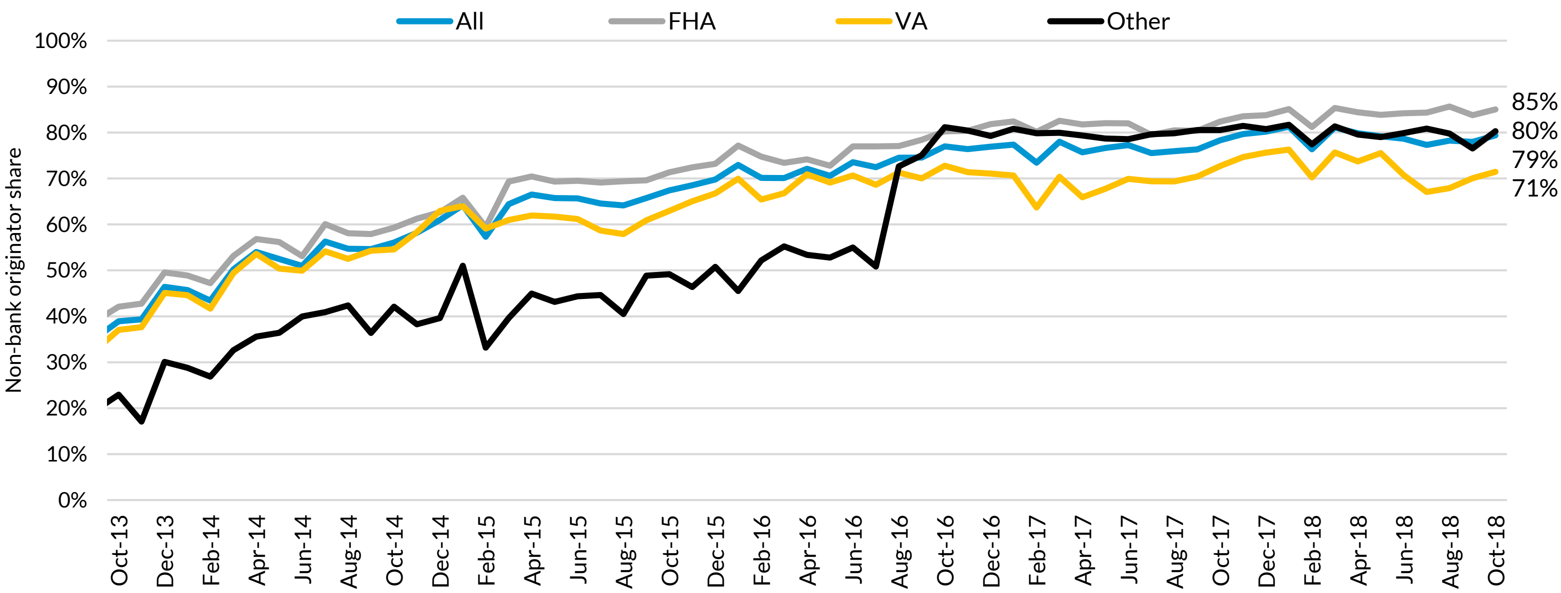


Sources: *eMBS and Urban Institute.* **Note:** *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2018.*

Ginnie Mae Nonbank Originators

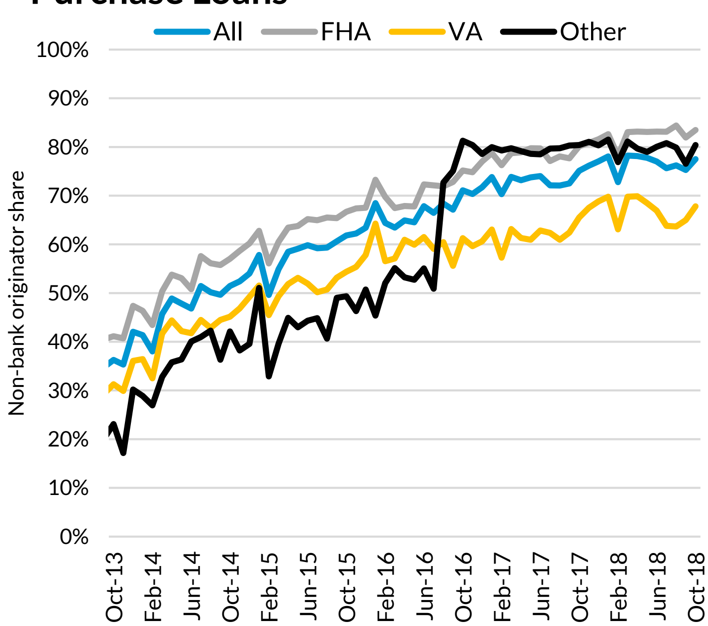
In October 2018, Ginnie Mae's nonbank share increased slightly to 79 percent. The nonbank originator share for FHA increased to 85 percent, just off the historical high of 86 percent reached in August. The nonbank originator share for VA rose to 71 percent, and the nonbank originator share for other loans increased to 80 percent.

Ginnie Mae Nonbank Originator Share: All Loans

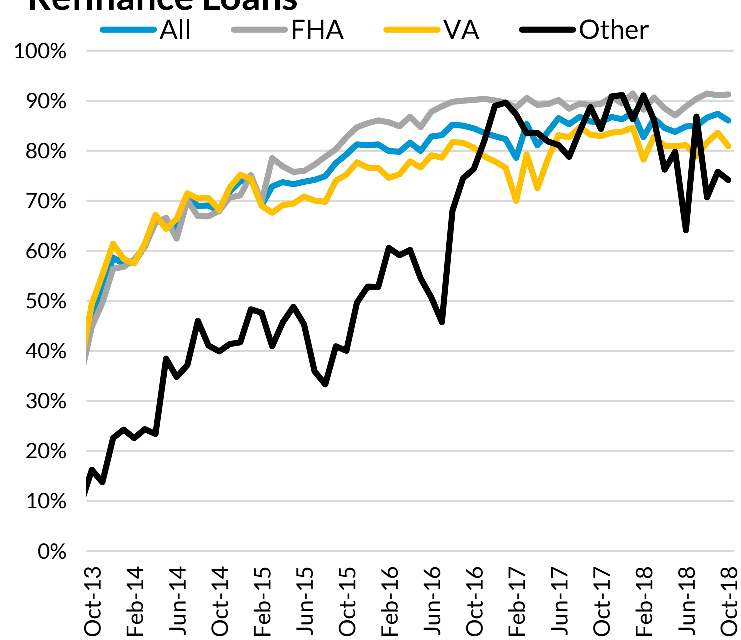


Sources: *eMBS and Urban Institute*
Note: *Data as of October 2018.*

Ginnie Mae Nonbank Share: Purchase Loans



Ginnie Mae Nonbank Share: Refinance Loans

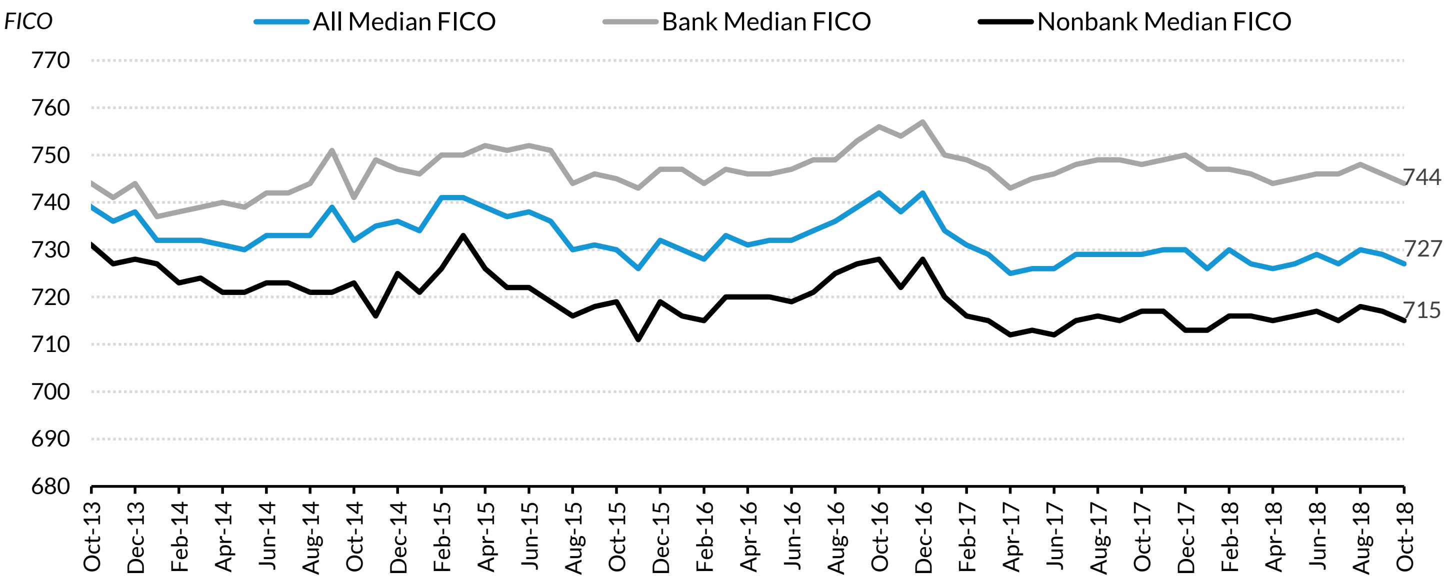


Sources: *eMBS and Urban Institute.* **Note:** *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2018.*

Nonbank Credit Box

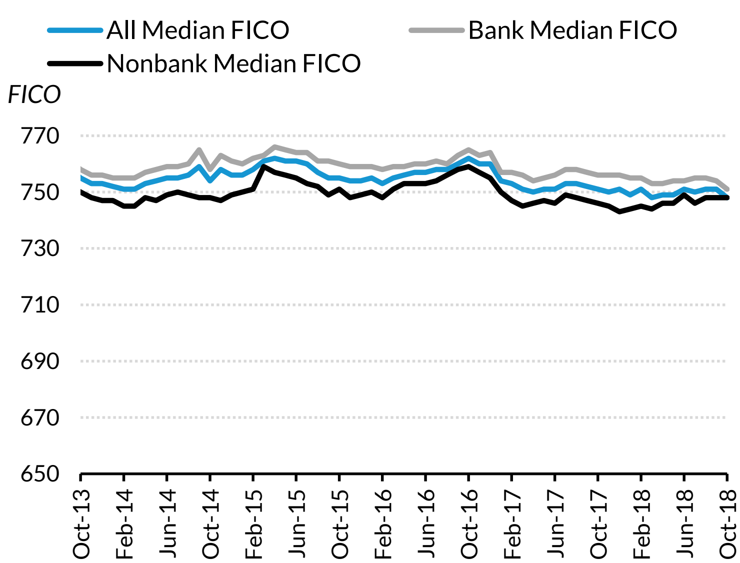
Nonbank originators have played a key role in opening up access to credit. The median GSE and the median Ginnie Mae FICO scores for loans originated by nonbanks are lower than their bank counterparts. Within the GSE space, both bank and nonbank FICOs have declined since 2014 with a further relaxation in FICOs since early 2017. In contrast, within the Ginnie Mae space, FICO scores for bank originations have increased since 2014 while nonbank FICOs have declined. This largely reflects the sharp cut-back in FHA lending by many banks.

Agency FICO: Bank vs. Nonbank



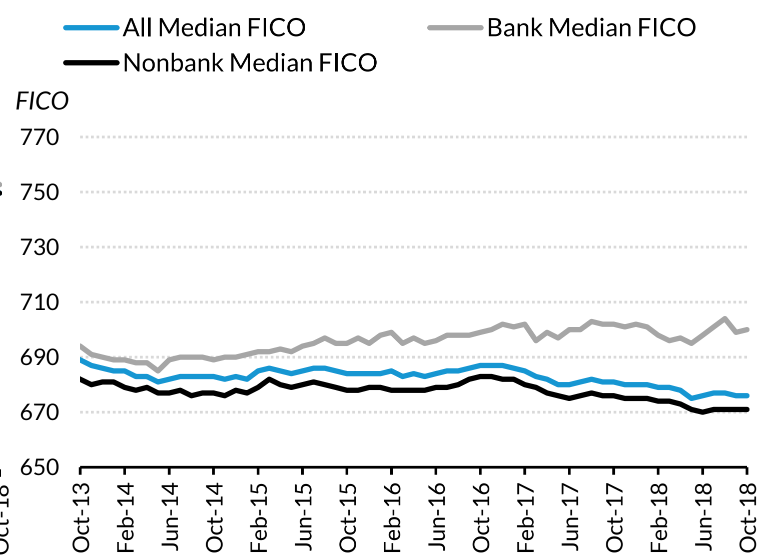
Sources: *eMBS and Urban Institute.* **Note**: *Data as of October 2018.*

GSE FICO: Bank vs. Nonbank



Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2018.*

Ginnie Mae FICO: Bank vs. Nonbank

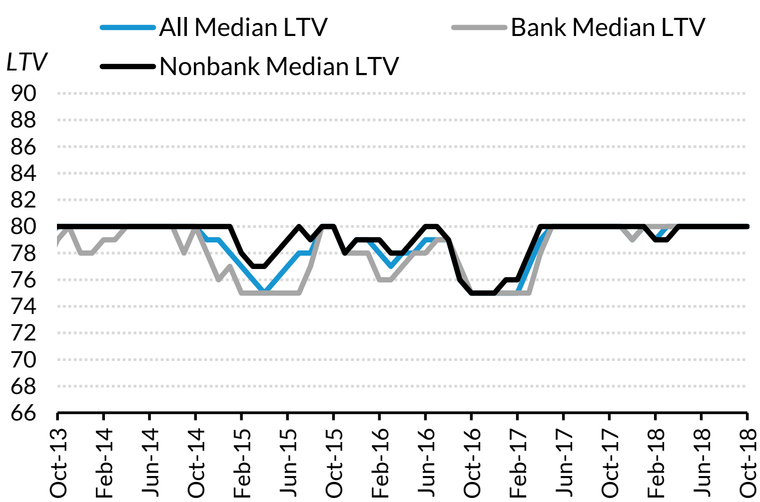


Sources: *eMBS and Urban Institute.*
Note: *Data as of October 2018.*

Nonbank Credit Box

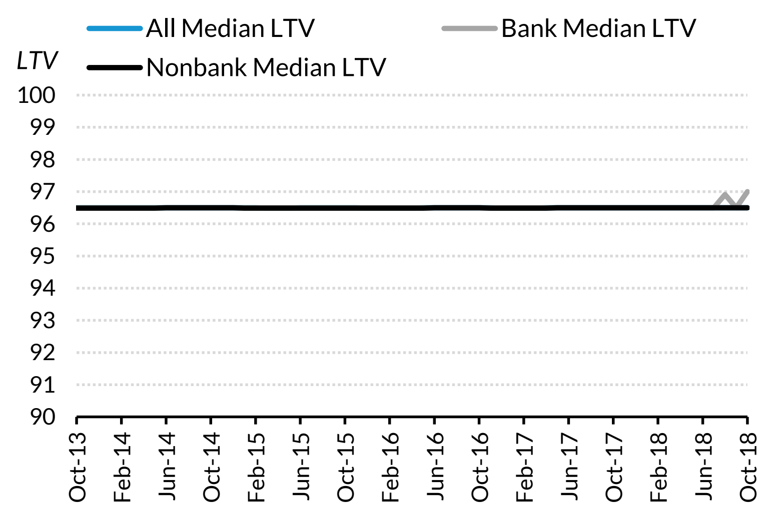
The median LTV ratios for loans originated by nonbanks are similar to that of their bank counterparts, while the median DTIs for nonbank loans are higher, indicating that nonbanks are more accommodating in this dimension as well as in the FICO dimension. Note that since early 2017, there has been a measurable increase in DTIs. This is true for both bank and non-bank originations. Rising DTIs are to be expected in a rising rate environment.

GSE LTV: Bank vs. Nonbank



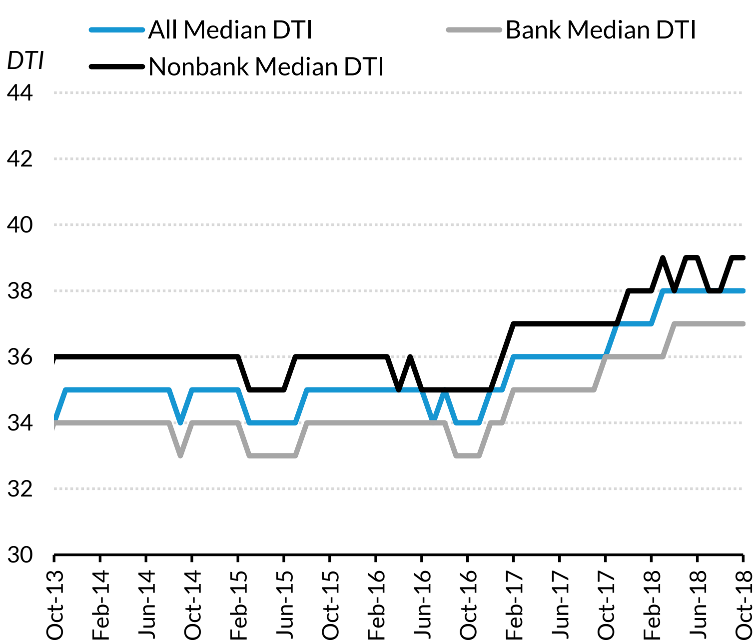
Sources: *eMBS and Urban Institute.* ***Note:*** *Data as of October 2018.*

Ginnie Mae LTV: Bank vs. Nonbank



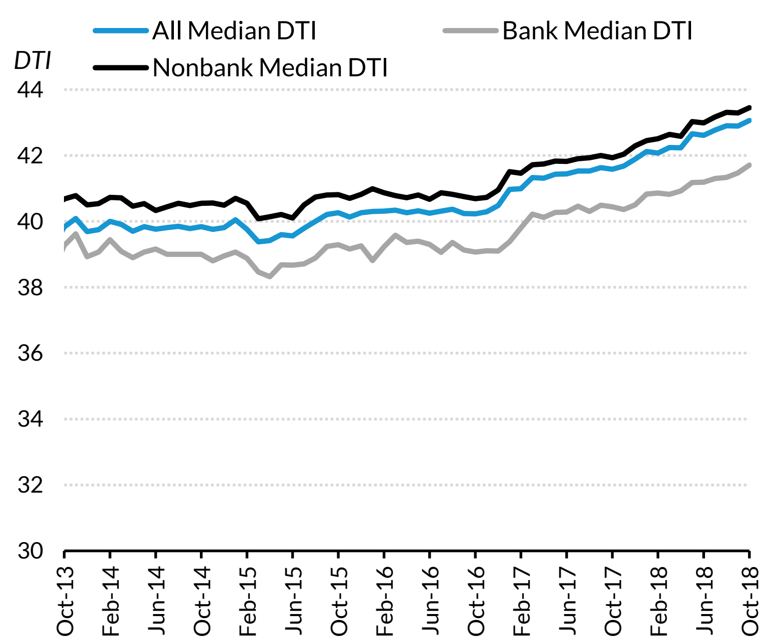
Sources: *eMBS and Urban Institute.* ***Note:*** *Data as of October 2018.*

GSE DTI: Bank vs. Nonbank



Sources: *eMBS and Urban Institute.* ***Note:*** *Data as of October 2018.*

Ginnie Mae DTI: Bank vs. Nonbank

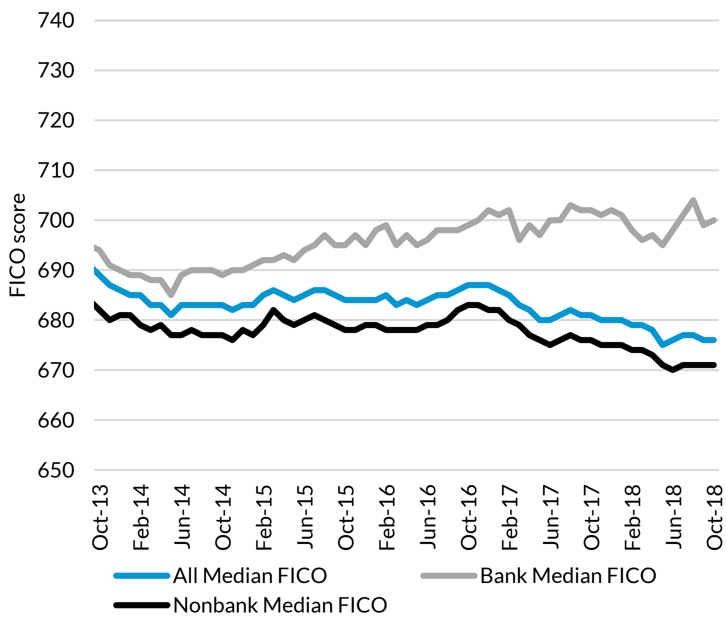


Sources: *eMBS and Urban Institute.* ***Note:*** *Data as of October 2018.*

Ginnie Mae Nonbank Originators: Credit Box

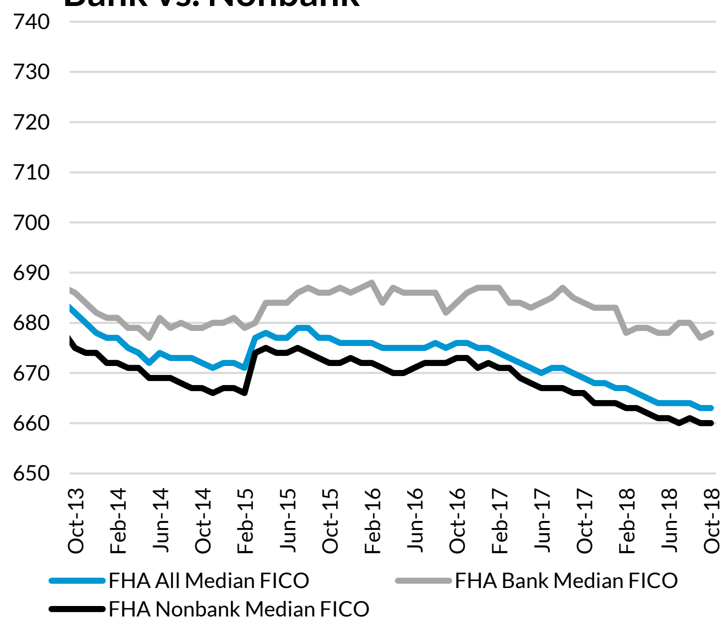
The FICO scores for Ginnie Mae bank originators increased slightly in October 2018, while FICO scores for nonbank originators stayed flat. The spread in the FICO scores between banks and non-banks remains close to their widest level since the data became available in 2013. The gap between banks and non-banks is very apparent in all programs backing Ginnie Mae securities: FHA, VA, and Other.

Ginnie Mae FICO Scores: Bank vs. Nonbank



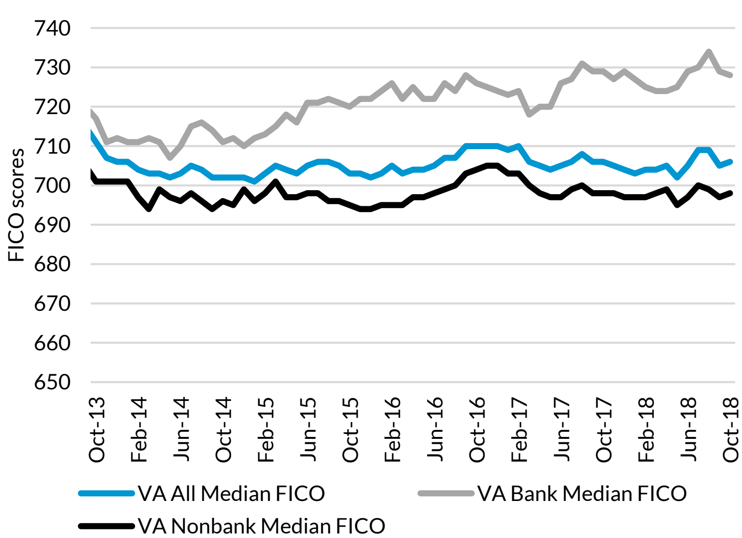
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae FHA FICO Scores: Bank vs. Nonbank



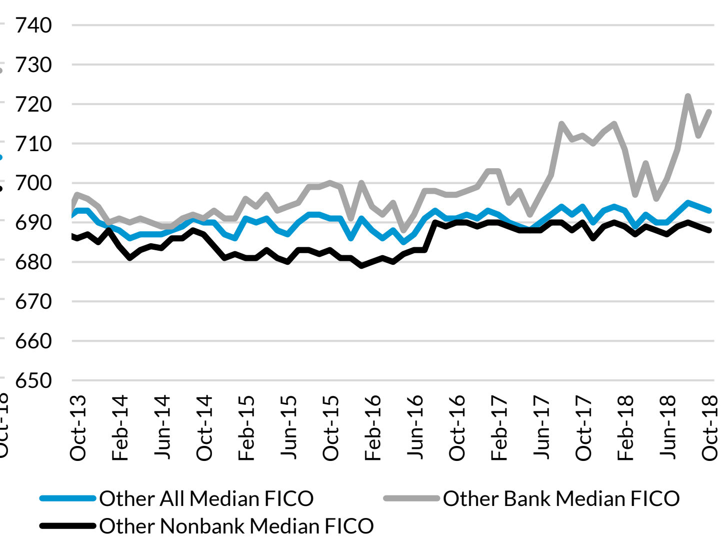
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae VA FICO Scores: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *Data as of October 2018.*

Ginnie Mae Other FICO Scores: Bank vs. Nonbank

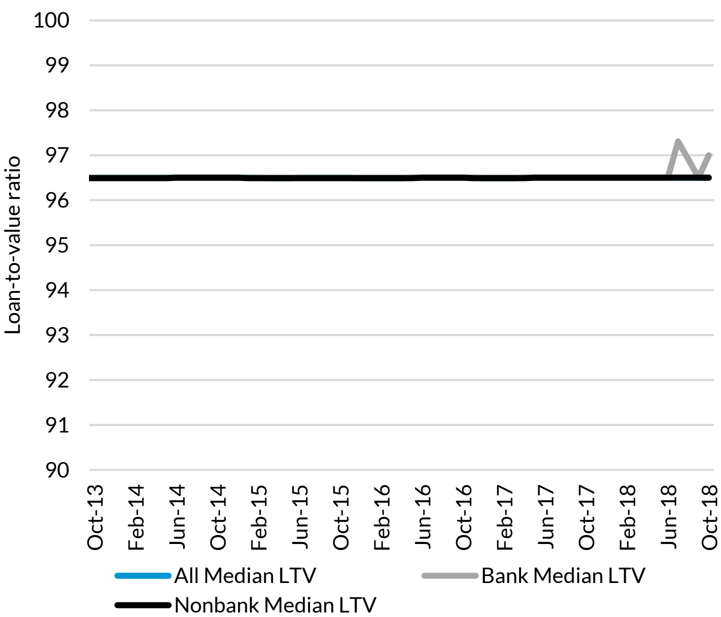


Sources: *eMBS and Urban Institute*
Note: *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2018.*

Ginnie Mae Nonbank Originators: Credit Box

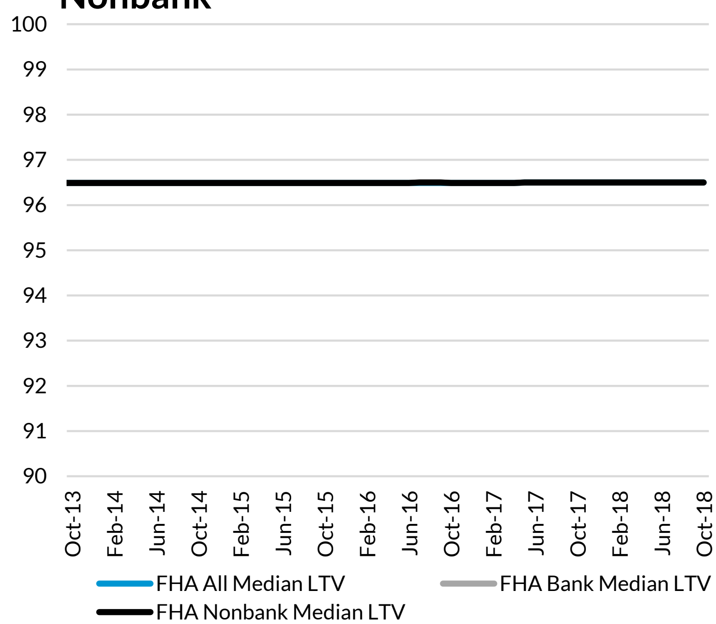
An analysis of the loans backing Ginnie Mae origination indicates that there are virtually no differences in median LTV ratios between bank originated loans and non-bank originated loans.

Ginnie Mae LTV: Bank vs. Nonbank



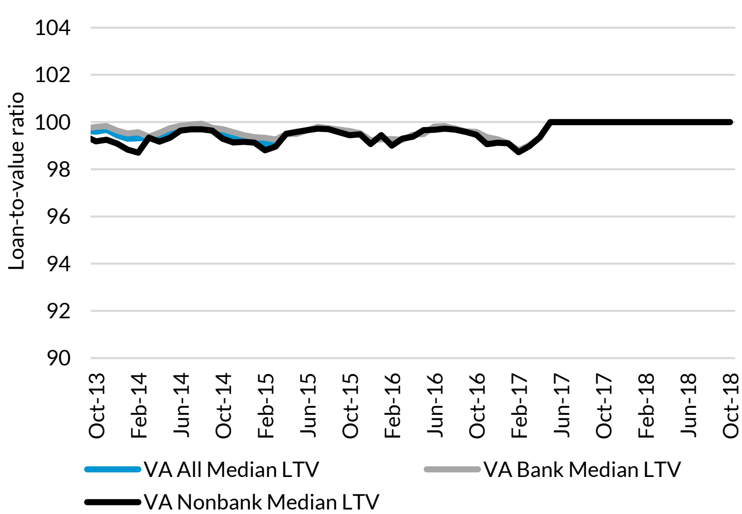
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae FHA LTV: Bank vs. Nonbank



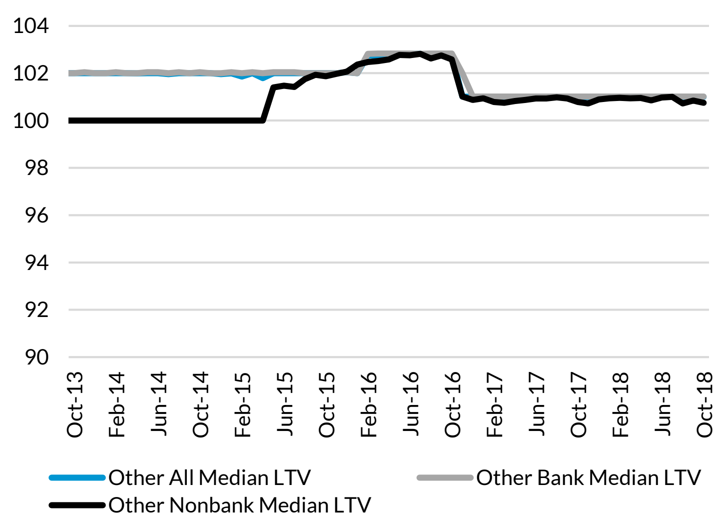
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae VA LTV: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *Data as of October 2018.*

Ginnie Mae Other LTV: Bank vs. Nonbank

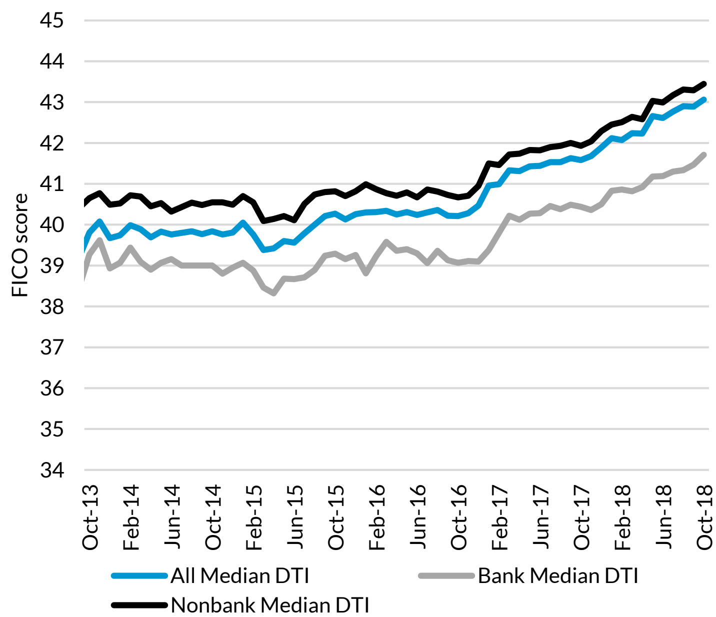


Sources: *eMBS and Urban Institute*
Note: *"Other" refers to loans insured by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of October 2018.*

Ginnie Mae Nonbank Originators: Credit Box

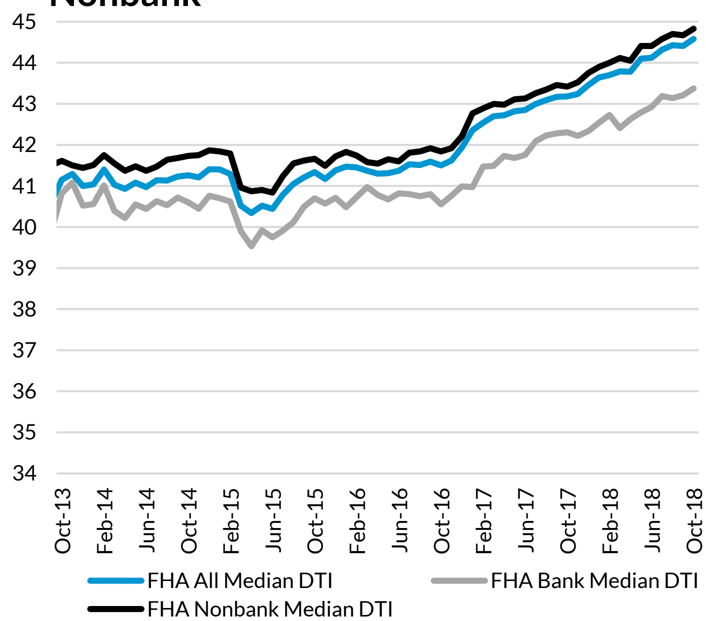
An analysis of borrowers' DTI ratios for bank versus non-bank originators indicates that the former have a lower median DTI. The DTIs for FHA and VA loans experienced notable increases since early 2017 for both bank and nonbank originations, while the Other originations' DTIs stayed relatively flat. Rising DTIs are to be expected in a rising rate environment.

Ginnie Mae DTI: Bank vs. Nonbank



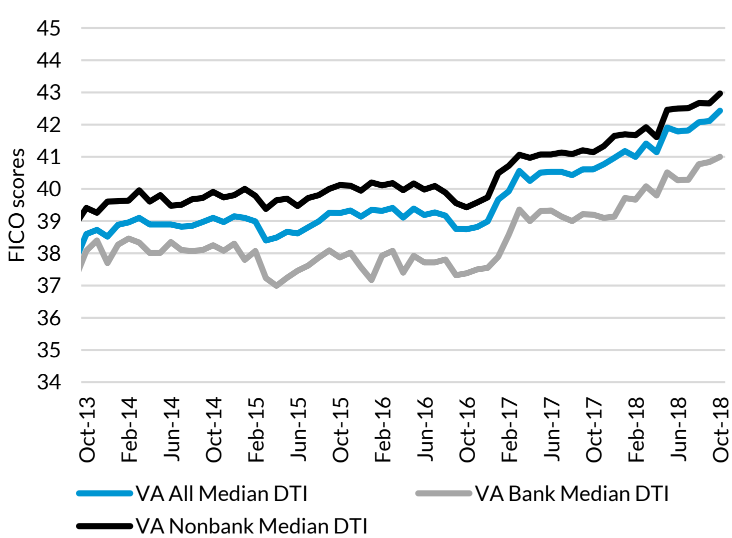
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae FHA DTI: Bank vs. Nonbank



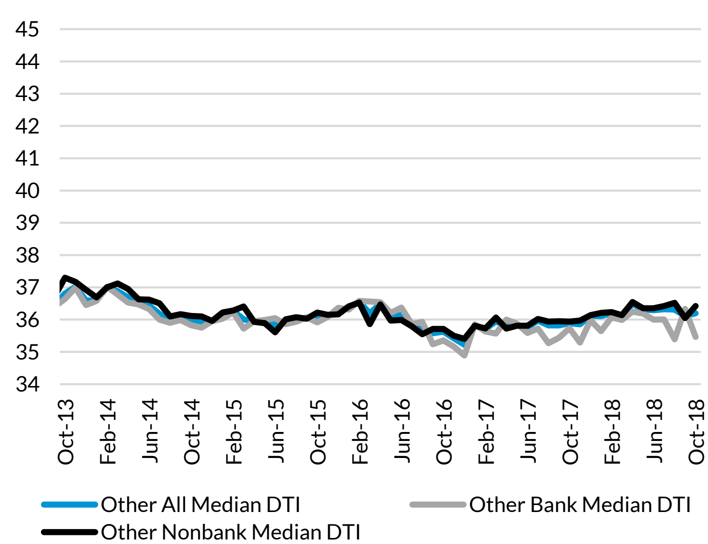
Sources: *eMBS and Urban Institute* **Note:** *Data as of October 2018.*

Ginnie Mae VA DTI: Bank vs. Nonbank



Sources: *eMBS and Urban Institute*
Note: *Data as of October 2018.*

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 2018.*

Holders of Ginnie Mae MSRs

This table shows largest 30 owners of mortgage servicing rights (MSR) by UPB for mortgages securitized through the Ginnie Mae program. As of October 2018, about half (50.6 percent) of outstanding Ginnie Mae mortgage servicing rights were owned by the top six firms. The top 30 firms collectively own over 80 percent. Twenty out of these 30 are non-depositories, while the remaining 10 are depositories.

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

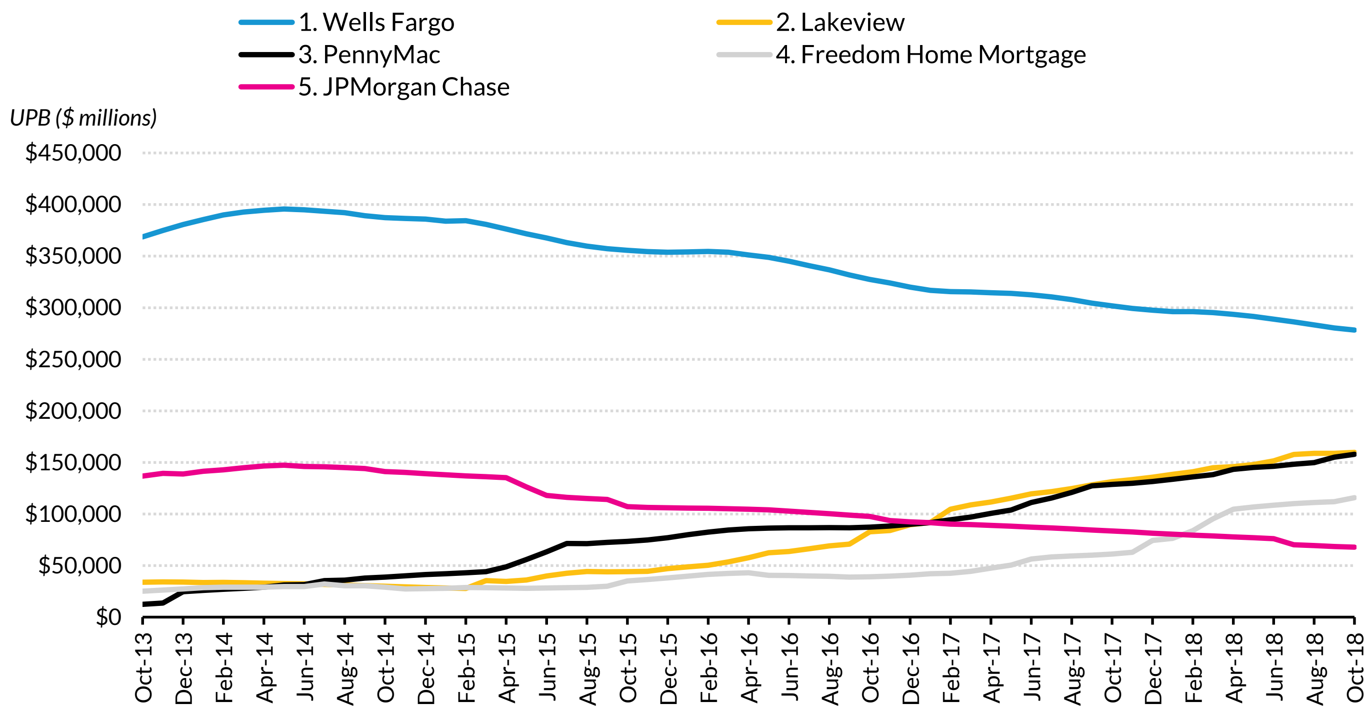
Rank	MSR Holder	UPB ($ millions)	Share	Cumulative Share
1	Wells Fargo	$278,416	16.7%	16.7%
2	Lakeview	$159,719	9.6%	26.3%
3	PennyMac	$157,969	9.5%	35.8%
4	Freedom Home Mortgage	$115,845	7.0%	42.8%
5	JPMorgan Chase	$67,814	4.1%	46.8%
6	Quicken Loans	$61,871	3.7%	50.6%
7	US Bank	$60,880	3.7%	54.2%
8	Nationstar	$54,717	3.3%	57.5%
9	Carrington Home Mortgage	$44,343	2.7%	60.2%
10	Caliber Home Loans	$39,979	2.4%	62.6%
11	USAA Federal Savings Bank	$35,021	2.1%	64.7%
12	Navy Federal Credit Union	$21,846	1.3%	66.0%
13	Midfirst	$20,686	1.2%	67.2%
14	Amerihome Mortgage	$20,411	1.2%	68.4%
15	Pacific Union Financial	$18,958	1.1%	69.6%
16	Ditech Financial	$18,723	1.1%	70.7%
17	Loan Depot	$18,420	1.1%	71.8%
18	The Money Source	$18,170	1.1%	72.9%
19	Suntrust	$17,015	1.0%	73.9%
20	New Penn Financial	$16,954	1.0%	74.9%
21	Branch Banking and Trust	$16,143	1.0%	75.9%
22	Home Point Financial	$15,855	1.0%	76.9%
23	Pingora	$15,570	0.9%	77.8%
24	Guild Mortgage	$14,638	0.9%	78.7%
25	Ocwen	$13,928	0.8%	79.5%
26	Homebridge Financial Services	$13,524	0.8%	80.3%
27	Bank of America	$12,950	0.8%	81.1%
28	PNC	$11,404	0.7%	81.8%
29	Citizens Bank	$10,620	0.6%	82.4%
30	Roundpoint	$10,288	0.6%	83.0%

Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

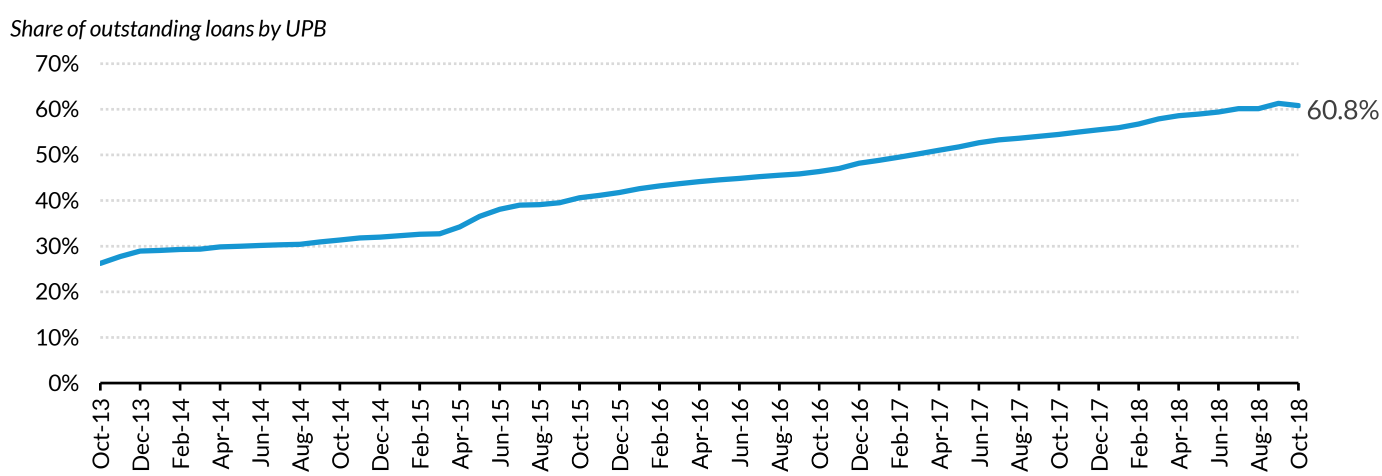
Holders of Ginnie Mae MSRs

The composition of the largest owners of Ginnie Mae MSR has evolved quite a bit over time. In December 2013, Wells Fargo and JP Morgan Chase were the two largest owners of Ginnie Mae MSRs, holding $375B and $139B in servicing UPB respectively. Although Wells Fargo is still the largest player, its portfolio has shrunk to $278 billion. Lakeview, PennyMac and Freedom Home Mortgage (all nonbanks) are the second, third and fourth largest owners of MSRs, owning $160 billion, $158 billion, and $116 billion respectively as of October 2018. Chase, which owns servicing rights for $67.8 billion in UPB has dropped to fifth place. As of October 2018, nonbanks collectively owned servicing rights for 60.8 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



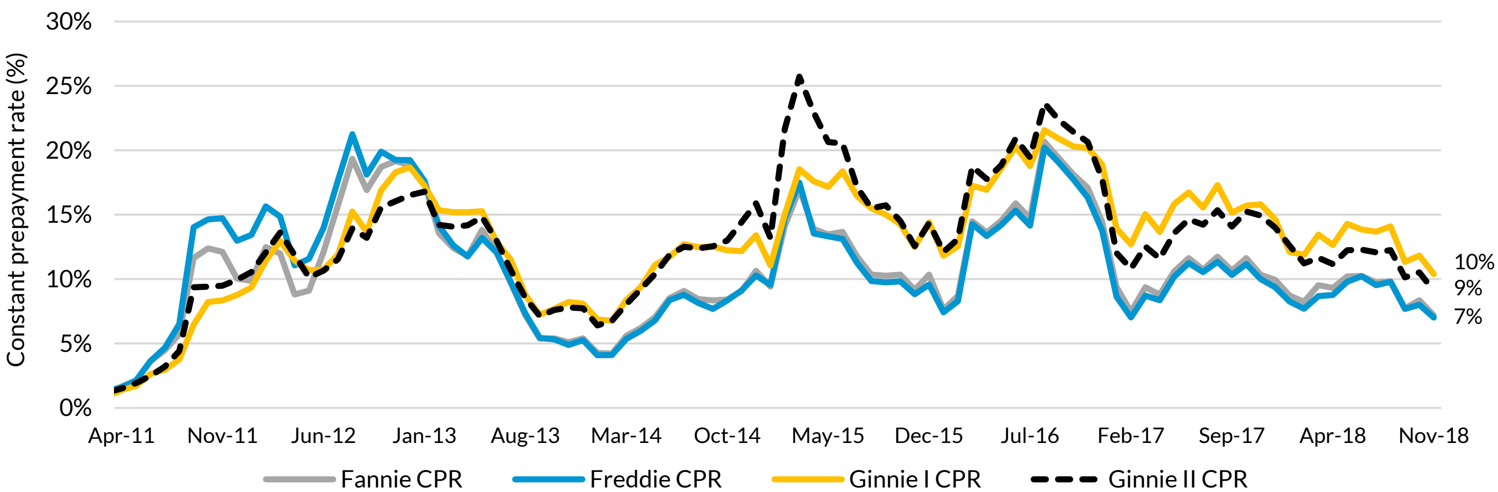
Sources: *eMBS and Urban Institute.* **Note:** *Data as of October 2018.*

Prepayments

Prepayments on Ginnie Mae securities were lower than on GSE securities from 2011 through mid-2013, but have been higher since. These increased Ginnie speeds reflect the growing share of VA loans, which prepay at faster speeds than either FHA or GSE loans. In addition, FHA puts fewer restrictions on the use of 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. Moreover, both FHA and VA permit refinancing of existing mortgages after 6 months, while the GSEs do not allow refinancing for a year.

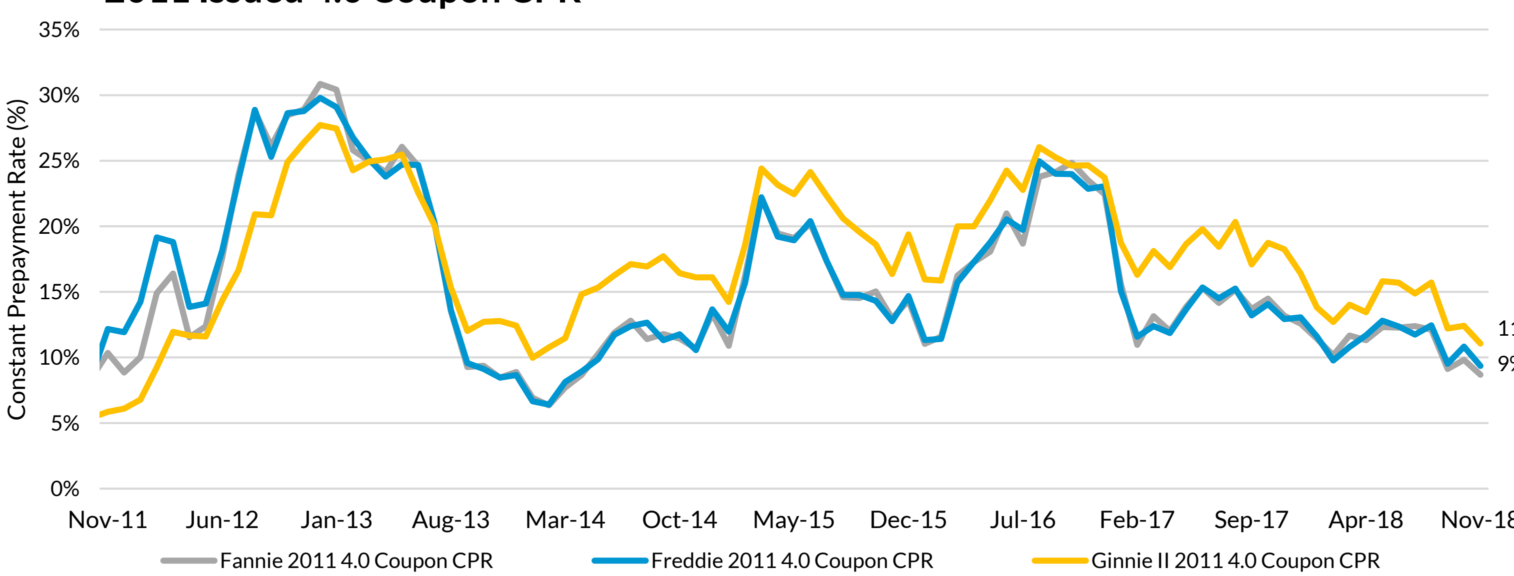
With the increase in interest rates since November 2016, the prepayment speeds for all agencies have slowed down considerably. Over the past 18 months, with the bulk of the mortgage universe finding it non-economic to refinance, the small month to month variations in speeds reflect seasonality, changes in day count and changes in mortgage rates. With mortgage rates substantially above 4%, we would expect prepayments in the coming months to remain at low levels.

Aggregate Prepayments



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2018.*

2011 Issued 4.0 Coupon CPR



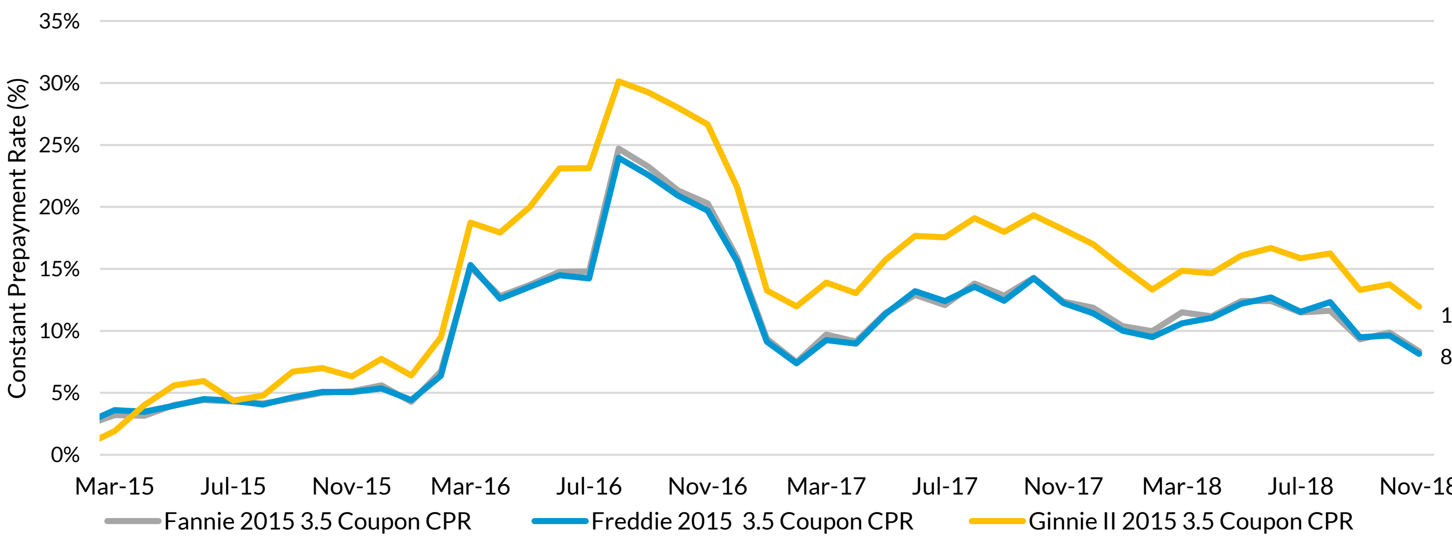
Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2018.*

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 at faster speeds than either FHA or GSE loans. The FHA streamlined programs are likely another contributor to the faster speeds.

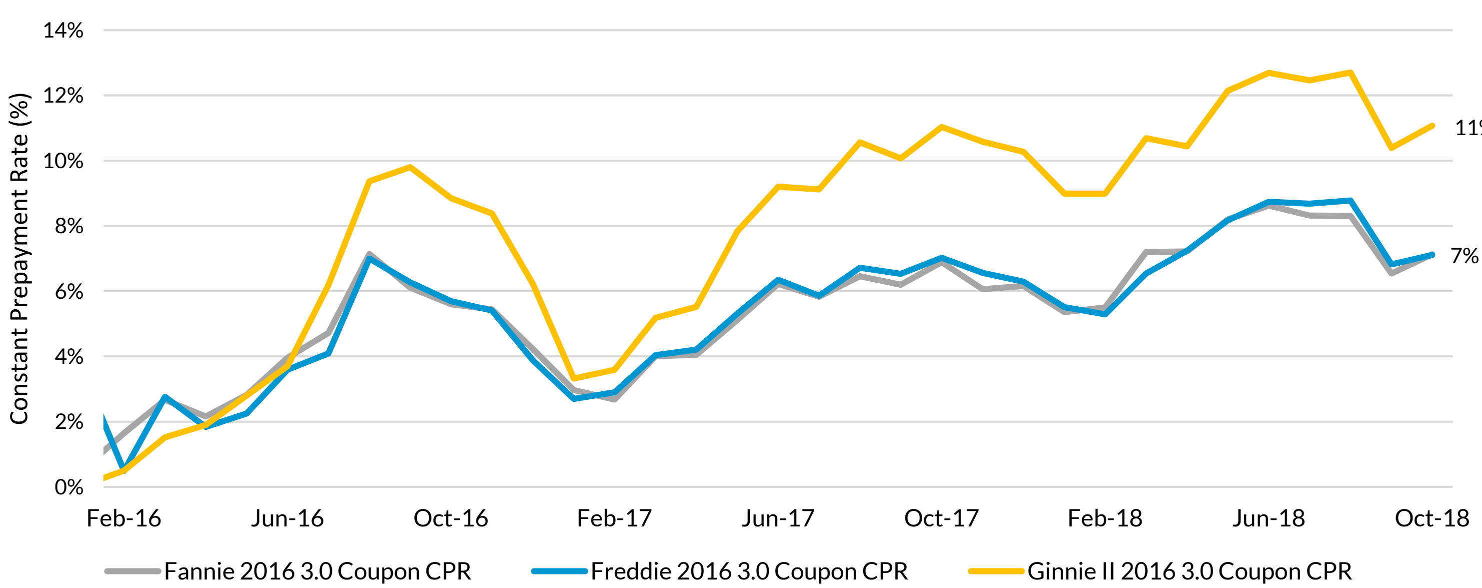
After a sharp mortgage rate rise in November 2016, the prepayment speeds of Ginnie and Conventional loans both fell dramatically. Over the past year, with the bulk of the mortgage universe finding it non-economic to refinance, the muted month to month variations in speeds reflect seasonality, changes in day count and changes in mortgage interest rates. With mortgage rates substantially above 4%, we would expect prepayments in the coming months to stay at low levels.

2015 Issued 3.5 Coupon CPR



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2018.*

2016 Issued 3.0 Coupon CPR

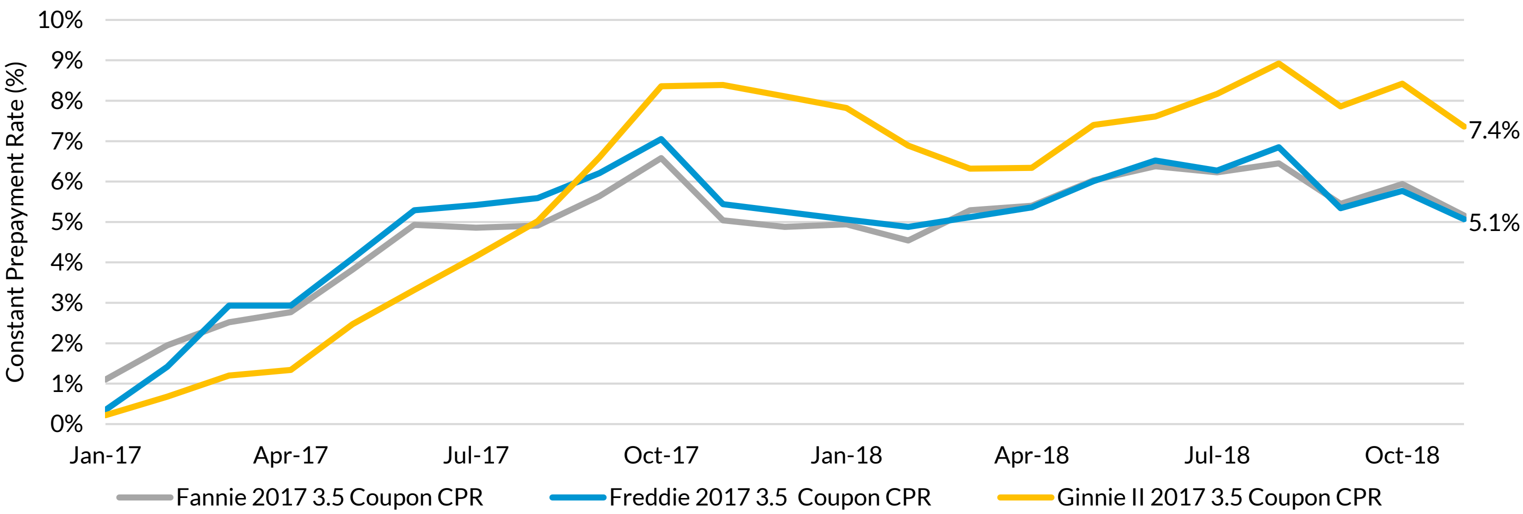


Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of October 2018.*

Prepayments

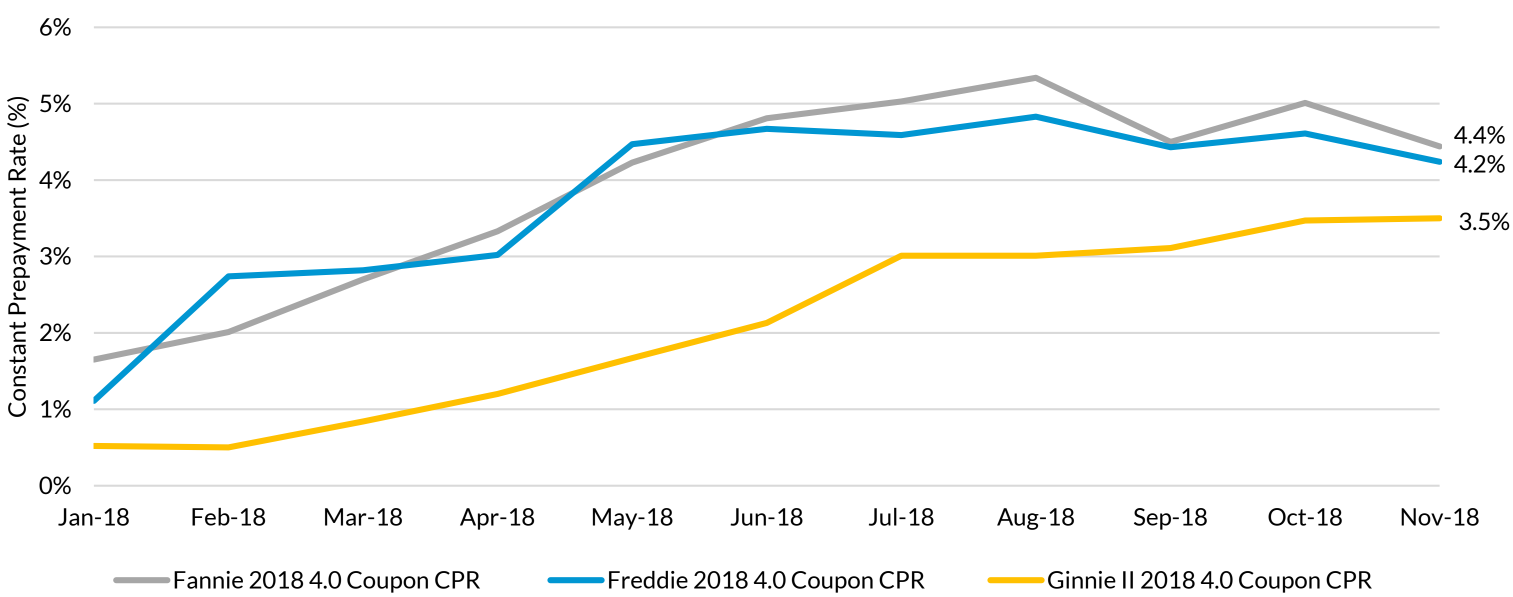
Ginnie Mae securities season more slowly than their conventional counterparts; they generally have lower prepayments in the early months. The charts below show the behavior of the 2017-issued 3.5s and the 2018-issued 4.0s, the largest coupon cohorts of those vintage years. Despite their slower seasoning, 2017 Ginnie II 3.5s have been prepaying faster than their conventional counterparts since late 2017, due primarily to fast VA prepayment speeds. In comparison, the 2018 Ginnie II 4.0s continue to prepay slower than their conventional counterparts.

2017 Issued 3.5 Coupon CPR



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of October 2018.*

2018 Issued 4.0 Coupon CPR

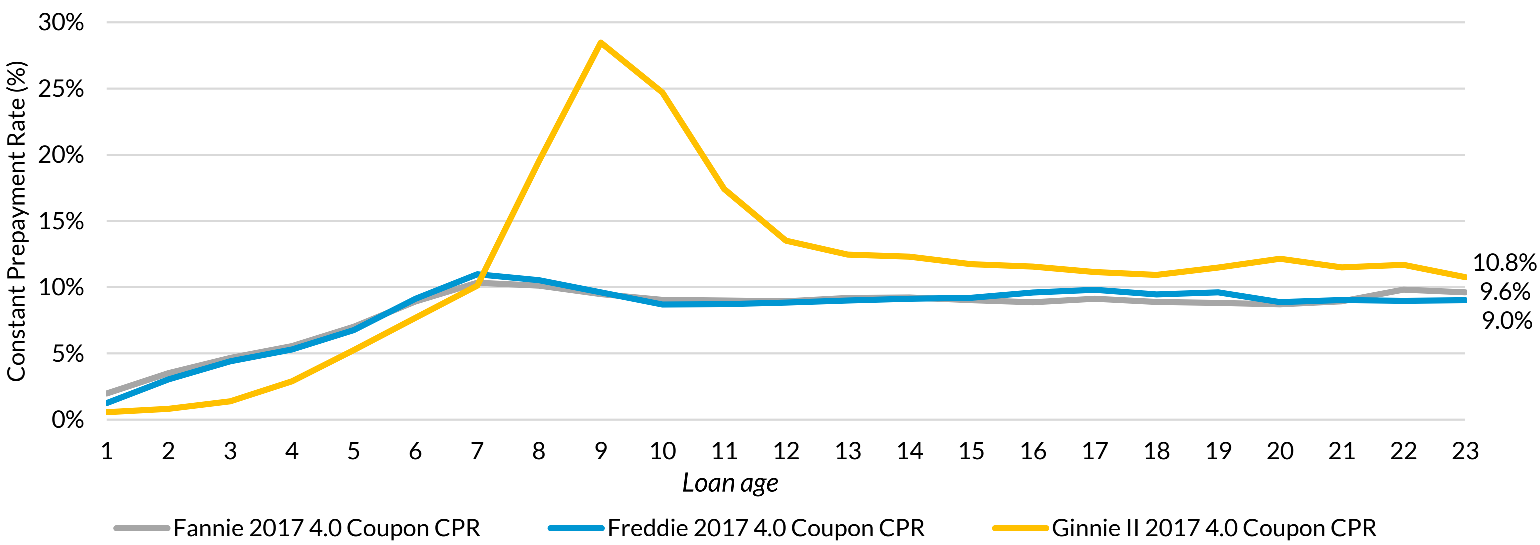


Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of October 2018.*

Prepayments

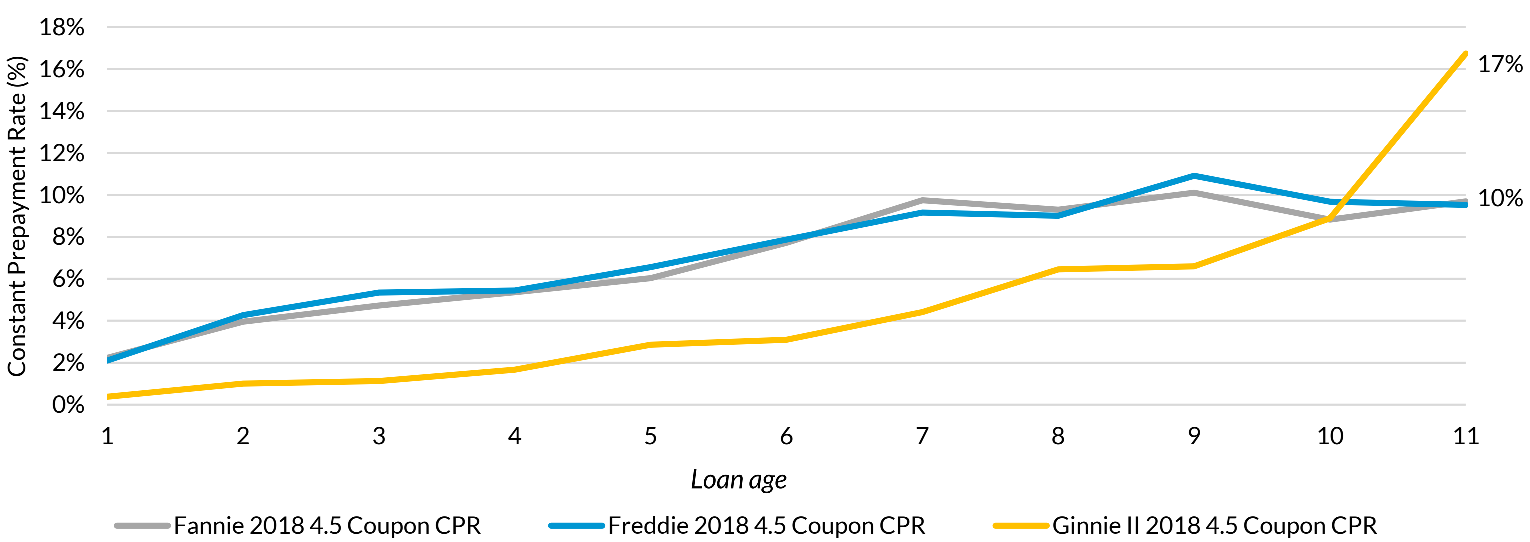
The charts below show the prepayment speeds by loan age for 2017 Ginnie II 4.0s and 2018 Ginnie II 4.5s—the cohorts 50 basis points above the largest coupon cohort for those years. Prepayment speeds on the Ginnie II 4.0s jumped up sharply at the 7-9 month loan age, reflecting abuse of the VA Streamlined Refi program (IRRRL). The 2018 Ginnie II 4.5s do not exhibit the same pattern, indicating the efforts by both Ginnie Mae and the VA to curb this abuse have been effective. 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. In addition, VA has implemented a net tangible benefit test, requiring the lender to show the borrower has obtained a benefit from the refinance.

2017 Issued 4.0 Coupon CPR, by Loan Age



Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2018.*

2018 Issued 4.5 Coupon CPR, by Loan Age

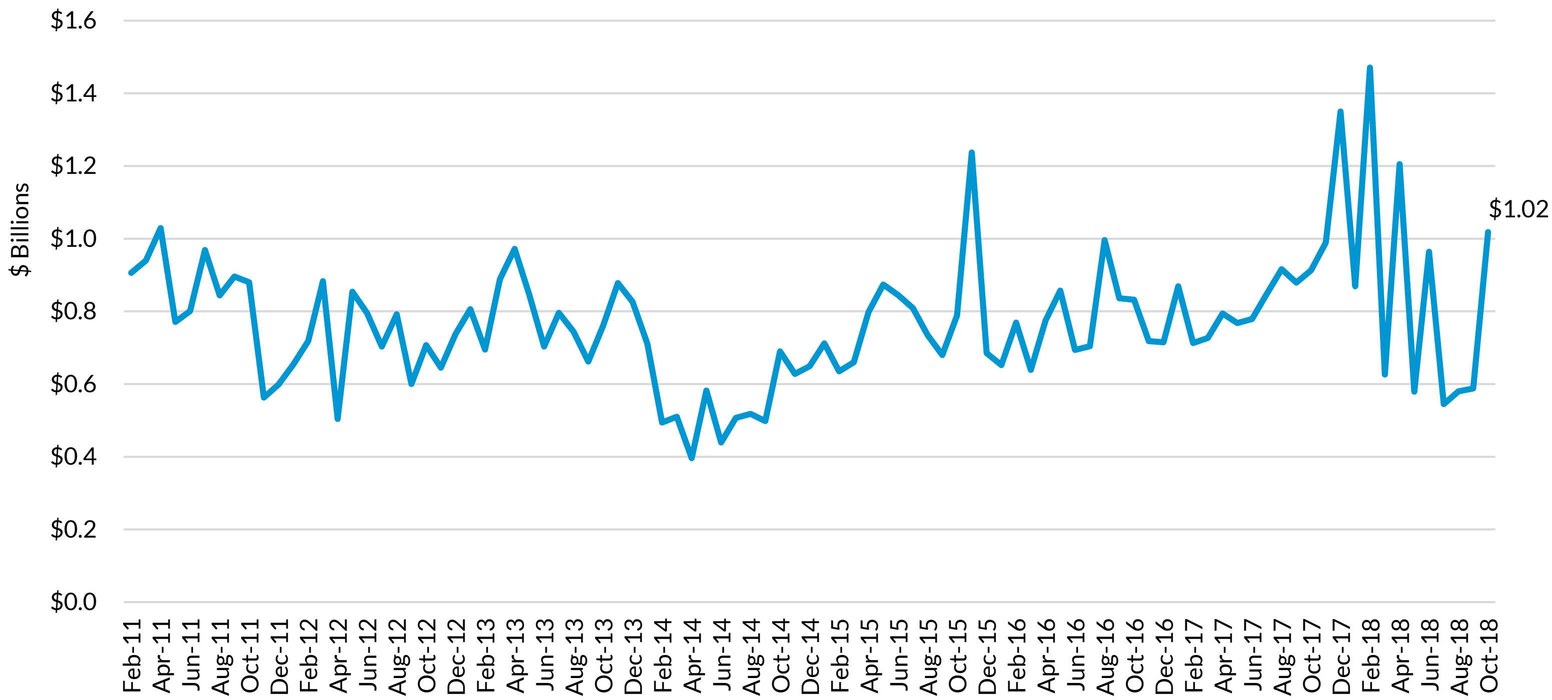


Sources: *Credit Suisse and Urban Institute.* **Note:** *Data as of November 2018.*

Other Ginnie Mae Programs Reverse Mortgage Volumes

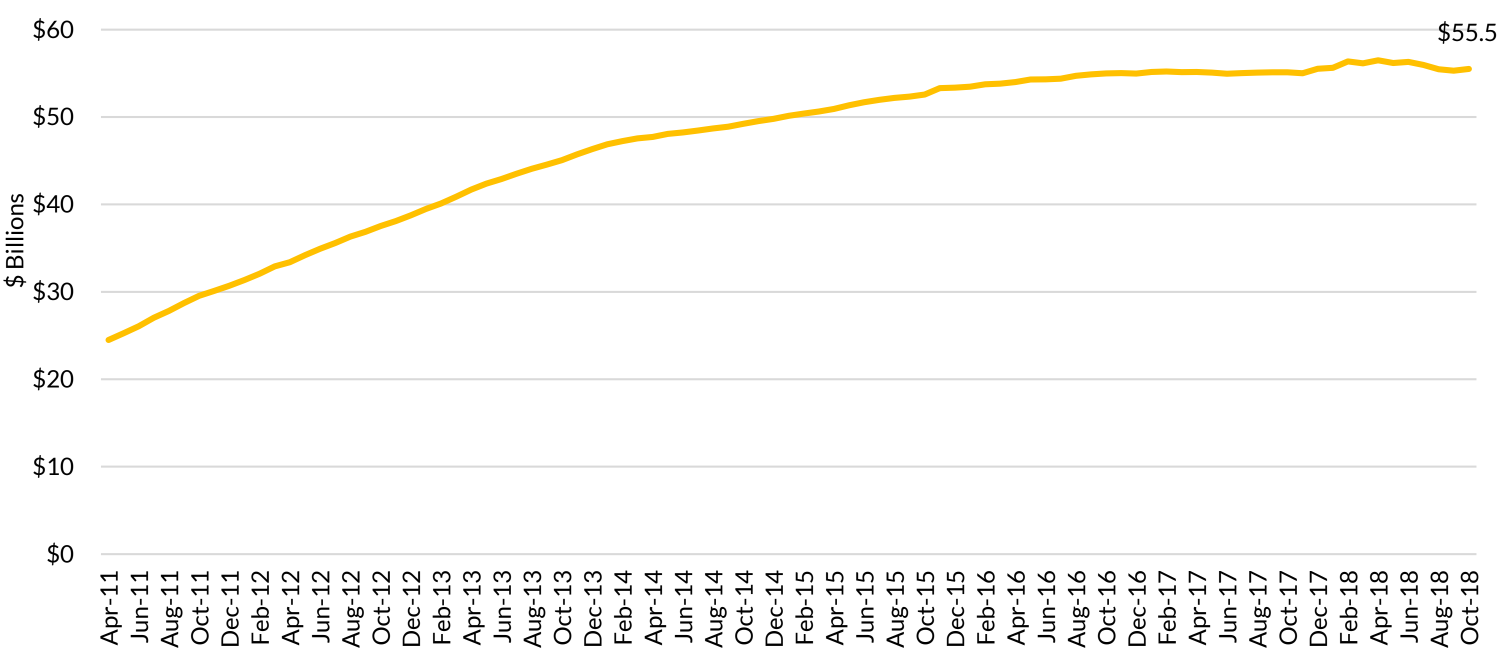
Ginnie Mae reverse mortgage issuance has been volatile in recent months. The October 2018 volume increased to $1.02 billion, on par with historical levels. Before this rebound, the issuance has been declining largely due to the implementation of the new, lower principal limit factors. In October 2018, outstanding reverse mortgage securities totaled $55.5 billion.

HMBS Issuance Volume



Sources: *Ginnie Mae and Urban Institute.* **Note:** *Data as of October 2018.*

HMBS Outstanding

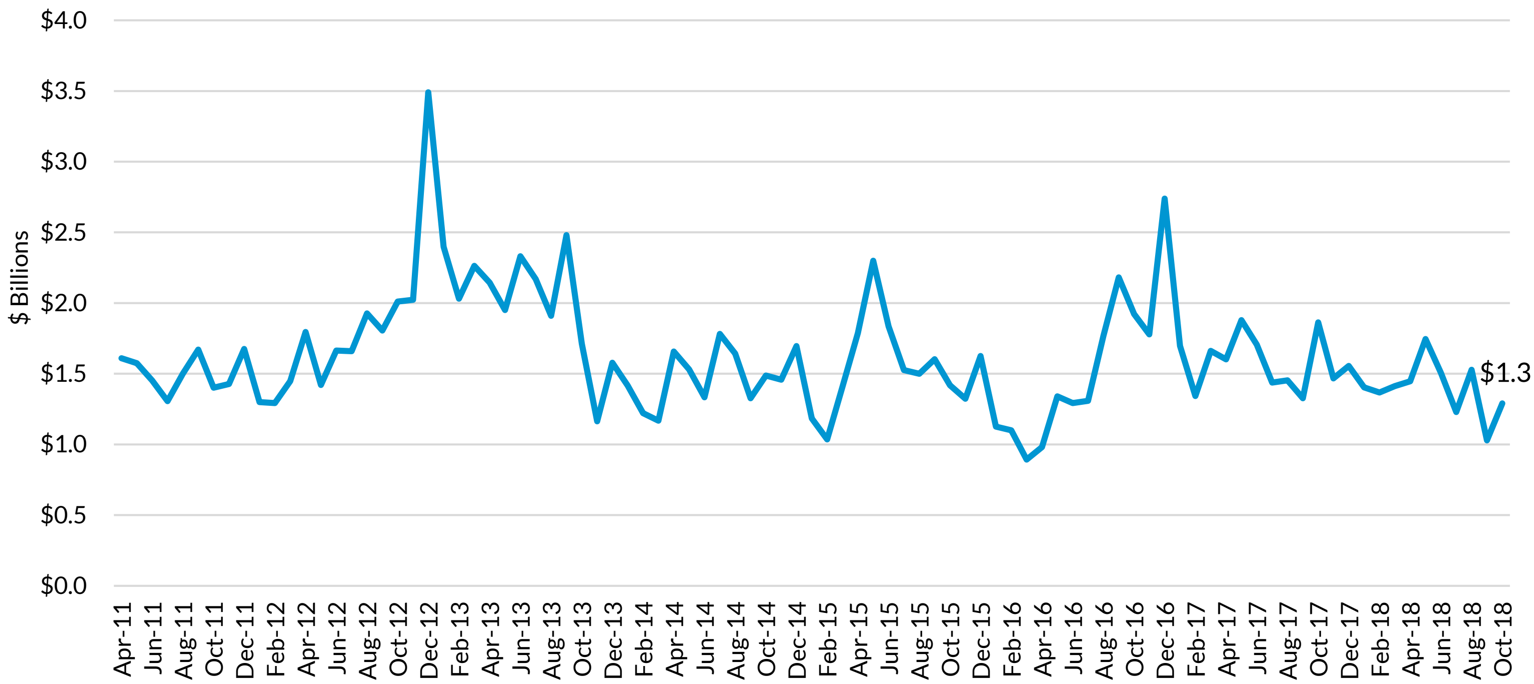


Sources: *Ginnie Mae and Urban Institute.* **Note:** *Data as of October 2018.*

Other Ginnie Mae Programs Multifamily Market

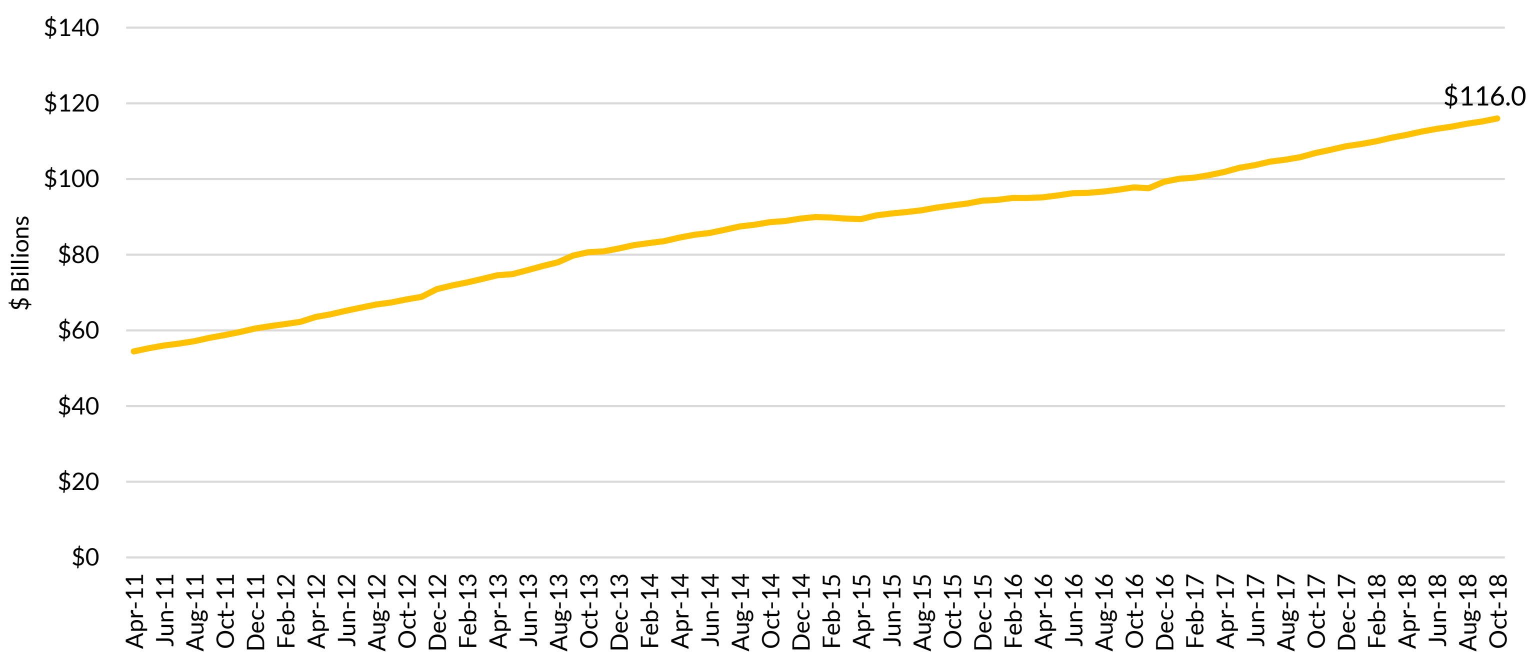
Ginnie Mae multifamily issuance volume in October 2018 totaled $1.3 billion, below average issuance levels of the past 18 months. Outstanding multifamily securities totaled $116.0 billion in October.

Ginnie Mae Multifamily MBS Issuance



Sources: *Ginnie Mae and Urban Institute.* **Note**: *Data as of October 2018.*

Ginnie Mae Multifamily MBS Outstanding

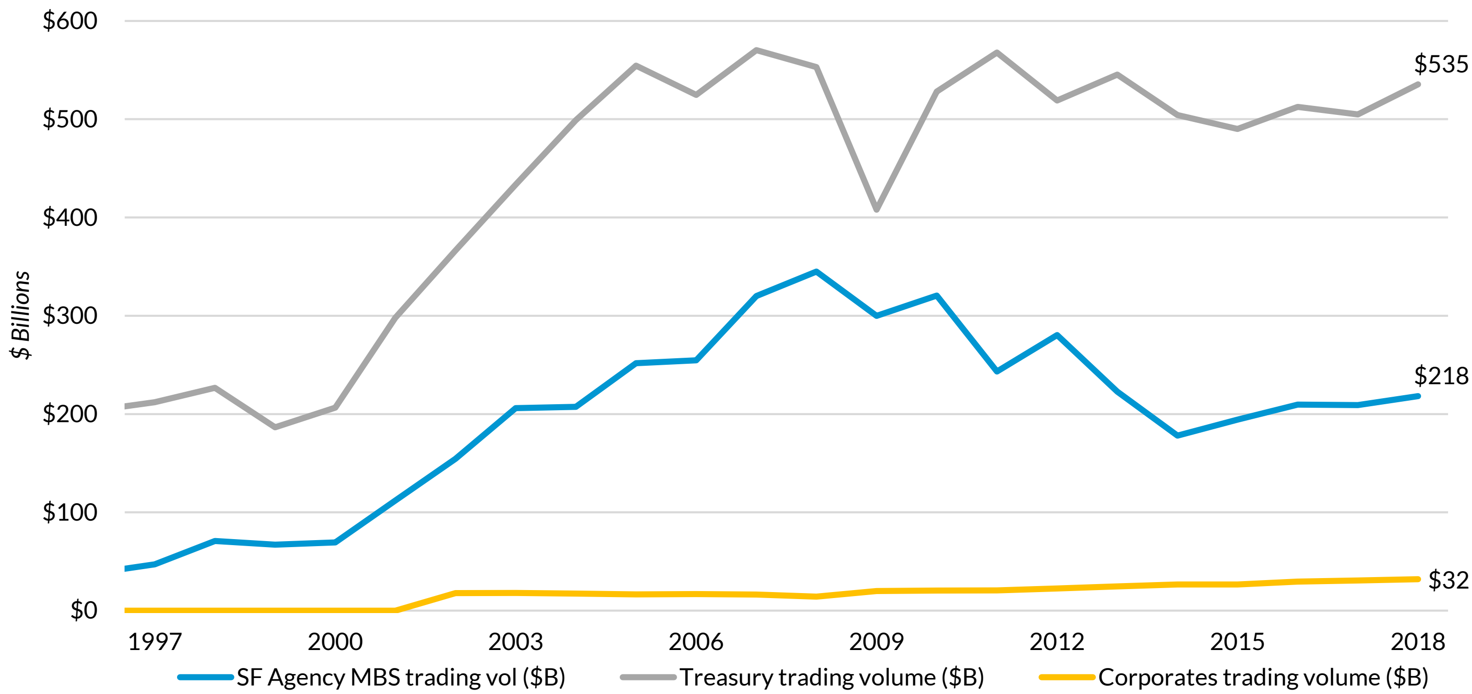


Sources: *Ginnie Mae and Urban Institute.* **Note**: *Data as of October 2018.*

Market Conditions

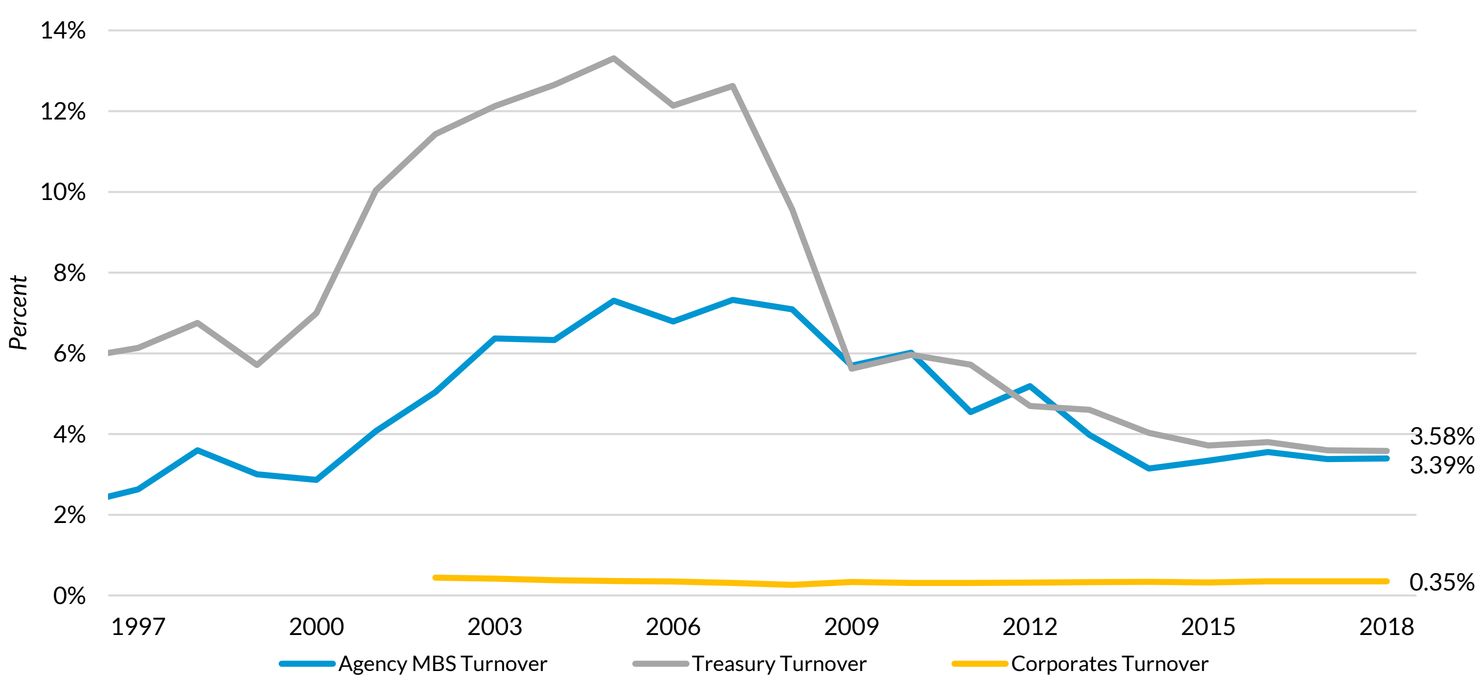
Agency MBS trading volume was $206 billion/day in November 2018; slightly more robust than in the 2014-2017 period. Agency MBS turnover in 2018 has been on pace with the 2014-2017 period; in the first eleven months of 2018, average daily MBS turnover was 3.39 percent versus 3.38 percent in 2017. Both 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 2018.*

Average Daily Turnover by Sector

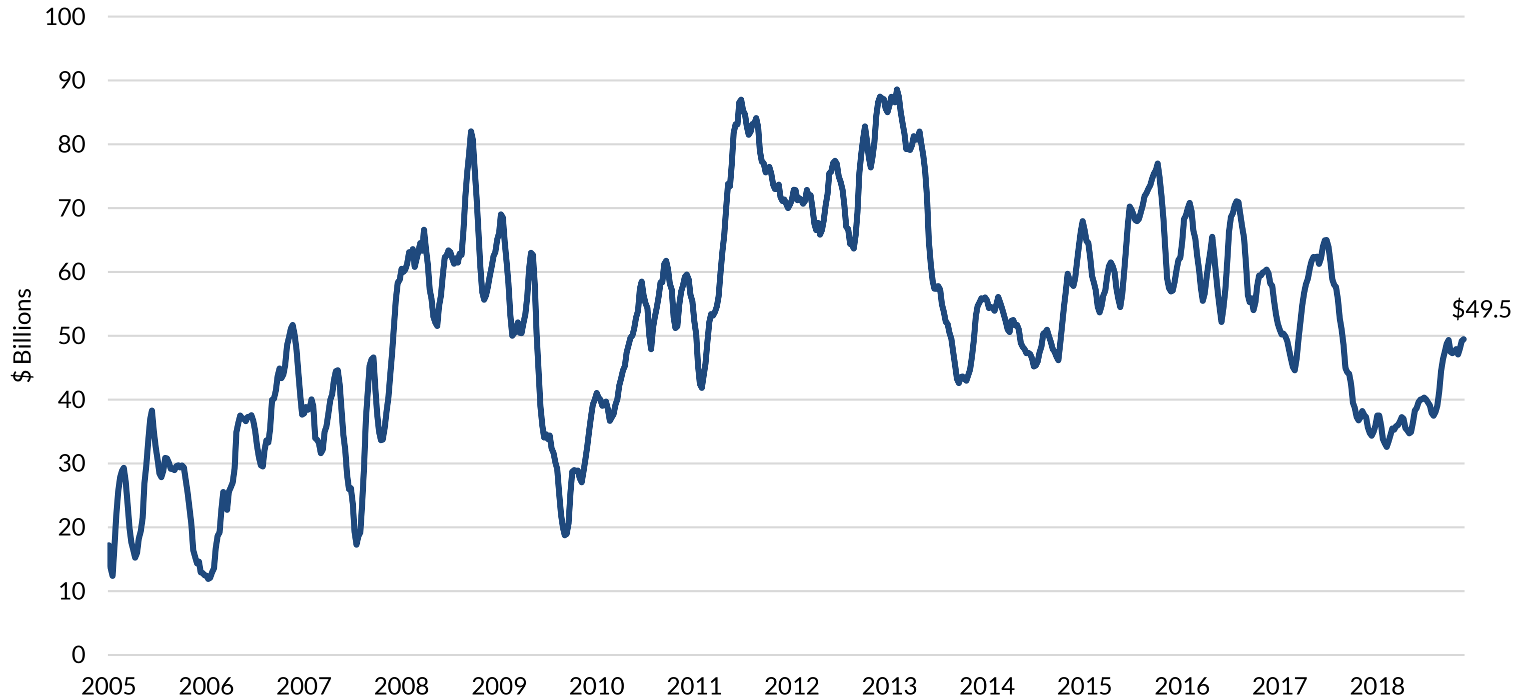


Sources: *SIFMA and Urban Institute.* ***Note:*** *Data as of November 2018.*

Market Conditions

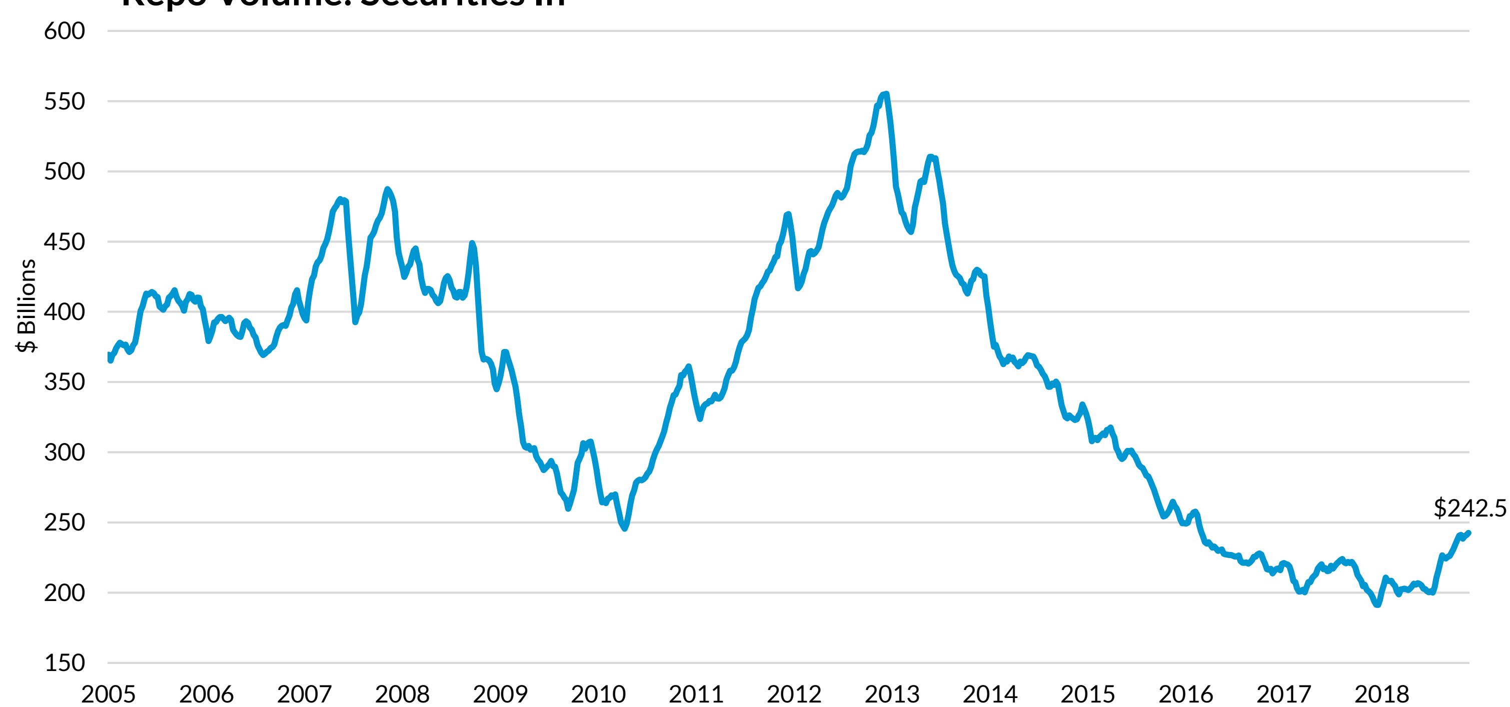
Dealer net positions in agency MBS are down from the 2012-2013 time period, but remain within historic ranges. Gross dealer positions are likely to have fallen more than net positions. The volume of repurchase activity is up slightly from the near 13-year low three months ago. The large decline through 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 2018.*

Repo Volume: Securities In

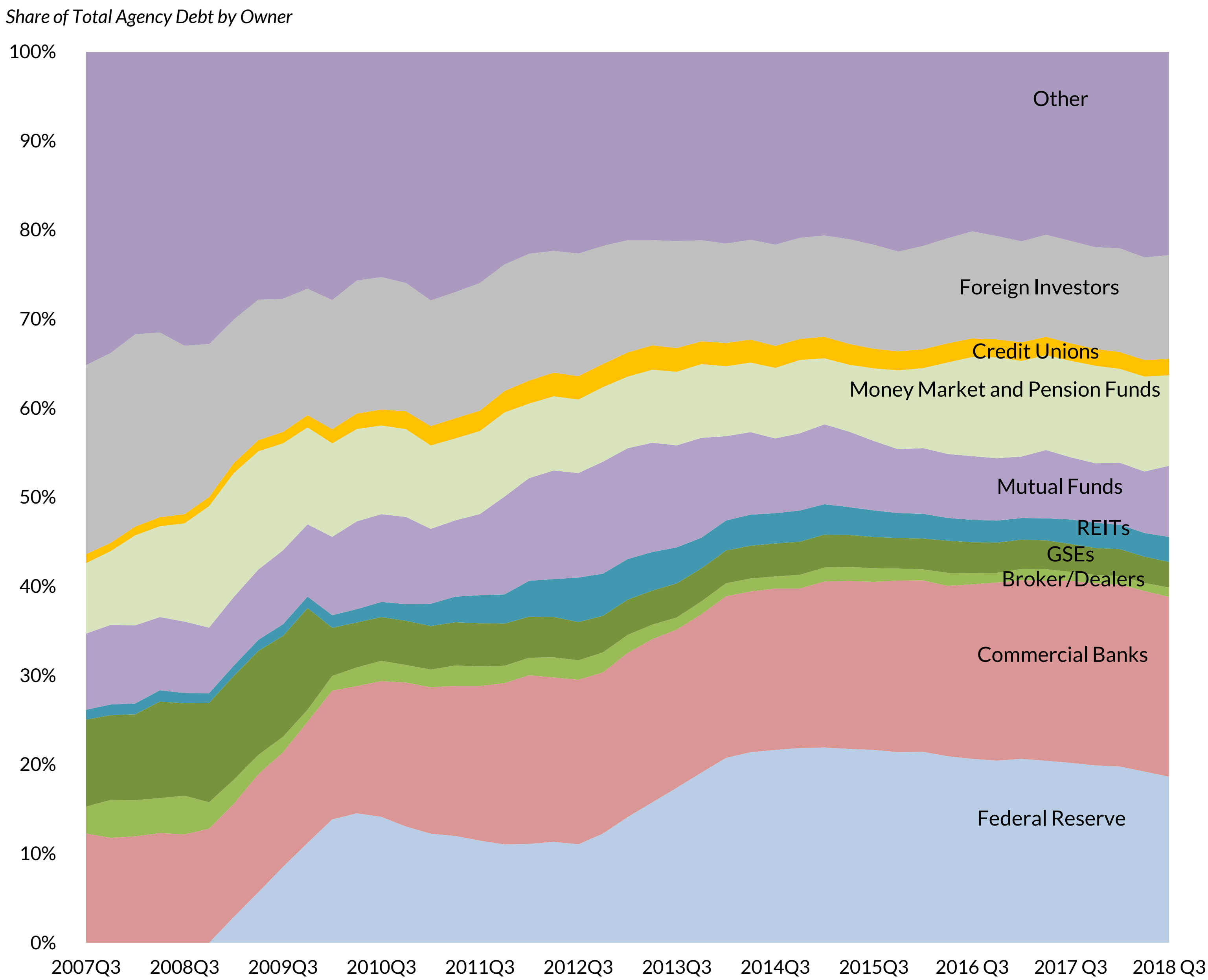


Sources: *Federal Reserve Bank of New York Primary Dealer Statistics and Urban Institute.* ***Note:*** *Data as of November 2018.*

MBS Ownership

The largest holders of agency debt (Agency MBS + Agency notes and bonds) include the Federal Reserve (19 percent), commercial banks (20 percent) and foreign investors (12 percent). The broker/dealer and GSE shares are a fraction of what they once were.

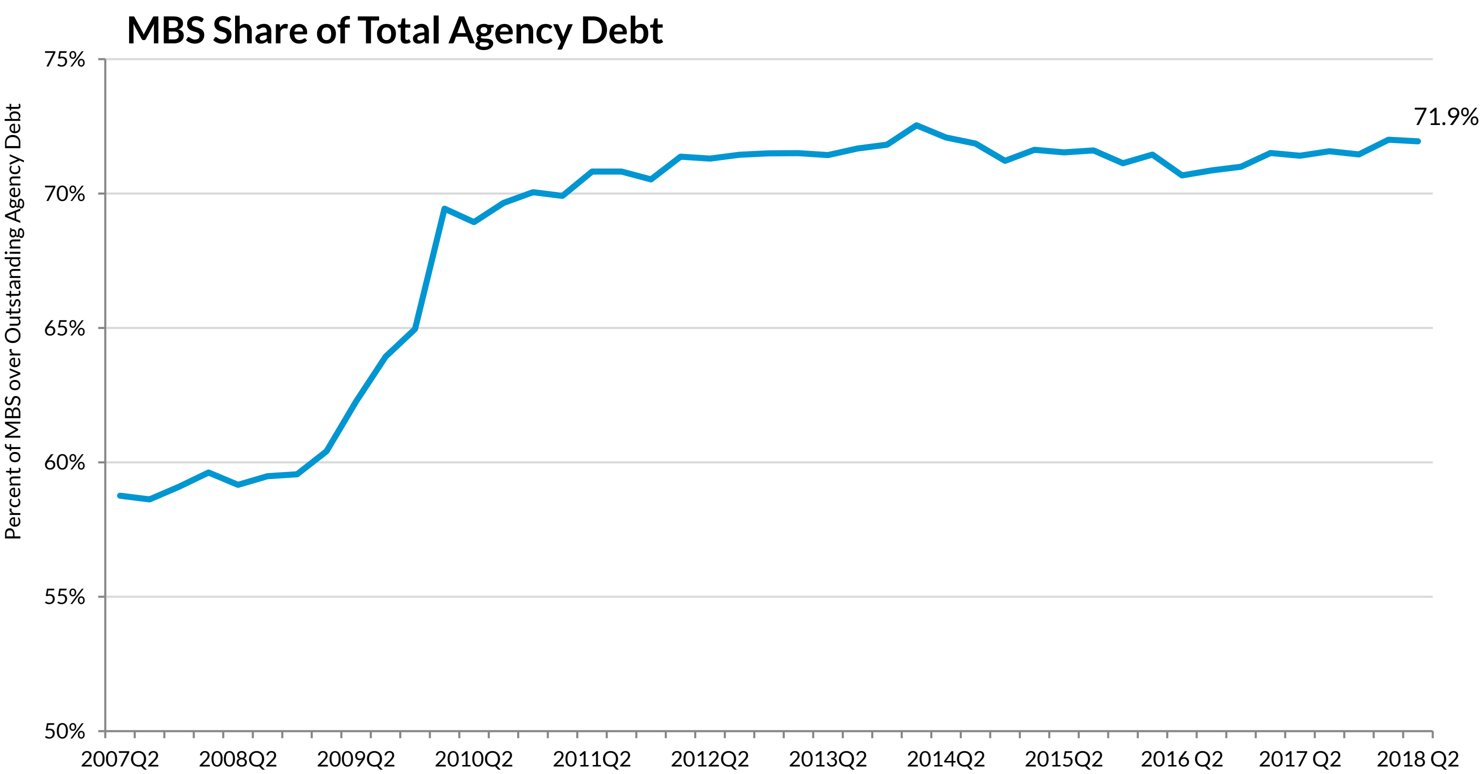
Who owns Total Agency Debt?



Sources: *Federal Reserve Flow of Funds and Urban Institute.* **Note**: *Data as of Q3 2018.*

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. For Q2 2018, 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 $1.8 trillion in holdings as of the end of November 2018, $1.3 trillion of it was held by the top 25 domestic banks.



Sources: *Federal Reserve Flow of Funds and Urban Institute.* ***Note***: *Data as of Q2 2018.*

	Commercial Bank Holdings ($Billions)								Week Ending			
	Oct-17	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov 7	Nov 15	Nov 21	Nov 28
Largest Domestic Banks	1,279.7	1,274.5	1,283.5	1,297.2	1,304.0	1,307.3	1,304.9	1,302.5	1,294.8	1,315.0	1,326.9	1,332.5
Small Domestic Banks	491.5	493.0	493.1	495.4	497.0	495.7	495.0	492.7	490.2	491.1	490.1	489.9
Foreign Related Banks	12.7	34.6	31.3	32.7	28.6	25.4	22.4	23.2	22.5	24.3	26.8	25.1
Total, Seasonally Adjusted	1,783.9	1,802.1	1,807.9	1,825.3	1,829.6	1,828.4	1,822.3	1,818.4	1,807.5	1,830.4	1,843.8	1,847.5

Sources: *Federal Reserve Bank and Urban Institute.* ***Note***: *Data as of November 2018.*

MBS Ownership

Out of the $1.8 trillion in MBS holdings at banks and thrifts, $1.3 trillion is in agency pass-through form: $966.52 trillion in GSE pass-throughs and $373.21 billion in Ginnie Mae pass-throughs. There are another $414.4 billion in Agency CMOs. Non-agency holdings total $38.46 billion. MBS holdings at banks and thrifts declined slightly in Q3 2018, although over the past 2 years, the growth has been quite strong, with Ginnie pass-throughs the fastest growing sector.

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
1Q16	$1,660.58	$1,133.29	$833.25	$300.04	$448.63	$10.27	$68.39
2Q 16	$1,684.33	$1,169.67	$867.64	$302.03	$440.25	$9.11	$65.29
3Q16	$1,732.36	$1,227.52	$924.81	$302.71	$435.77	$7.90	$61.17
4Q16	$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

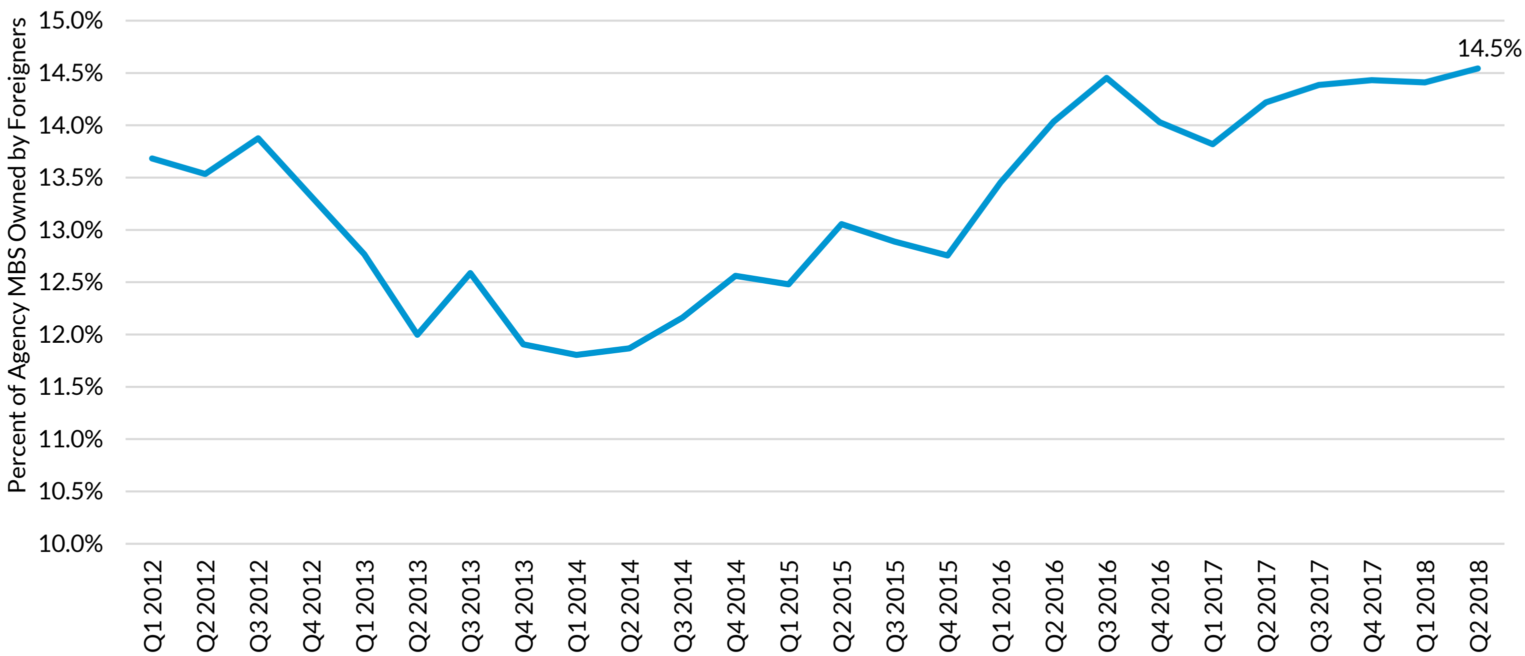
	Top Bank & Thrift Residential MBS Investors	Total ($MM)	GSE PT ($MM)	GNMA PT ($MM)	Agency REMIC ($MM)	Non-Agency ($MM)	Market Share
1	Bank of America Corporation	$318,433	$187,152	$119,313	$11,841	$127	17.7%
2	Wells Fargo & Company	$236,391	$168,041	$61,465	$3,960	$2,925	13.2%
3	JP Morgan Chase & Co.	$91,305	$57,256	$24,510	$322	$9,217	5.1%
4	U S. Bancorp.	$77,495	$37,076	$14,024	$29,393	$1	4.3%
5	Charles Schwab Bank	$76,747	$45,538	$12,196	$19,013	$0	4.3%
6	Capital One Financial Corporation	$64,680	$27,444	$14,344	$21,872	$1,021	3.6%
7	Citigroup Inc.	$61,064	$45,878	$4,304	$7,952	$2,930	3.4%
8	Bank of New York Mellon Corp.	$51,071	$30,503	$1,786	$17,255	$1,527	2.8%
9	PNC Bank, National Association	$45,857	$36,539	$3,910	$2,902	$2,507	2.6%
10	Branch Banking and Trust Company	$37,221	$12,259	$5,969	$18,464	$529	2.1%
11	State Street Bank and Trust Company	$35,541	$12,242	$11,503	$8,354	$3,433	2.0%
12	E*TRADE Bank	$24,257	$11,179	$4,244	$8,833	$0	1.4%
13	HSBC Banks USA, National Association	$23,548	$7,169	$6,442	$9,935	$3	1.3%
14	KeyBank National Association	$23,269	$1,213	$934	$21,122	$0	1.3%
15	SunTrust Bank	$22,435	$11,721	$10,714	$0	$0	1.3%
16	Morgan Stanley	$22,029	$9,355	$6,606	$6,068	$0	1.2%
17	Ally Bank	$18,686	$10,332	$3,176	$2,759	$2,419	1.0%
18	The Northern Trust Company	$18,593	$7,892	$27	$10,633	$41	1.0%
19	MUFG Union Bank	$17,581	$5,933	$4,052	$6,735	$862	1.0%
20	Regions Bank	$17,533	$10,359	$4,384	$2,788	$2	1.0%
	Total Top 20	**$1,283,736**	**$735,081**	**$313,902**	**$210,201**	**$27,542**	**71.6%**

Sources: *Inside Mortgage Finance and Urban Institute.* ***Note:*** *Data as of Q3 2018.*

MBS Ownership

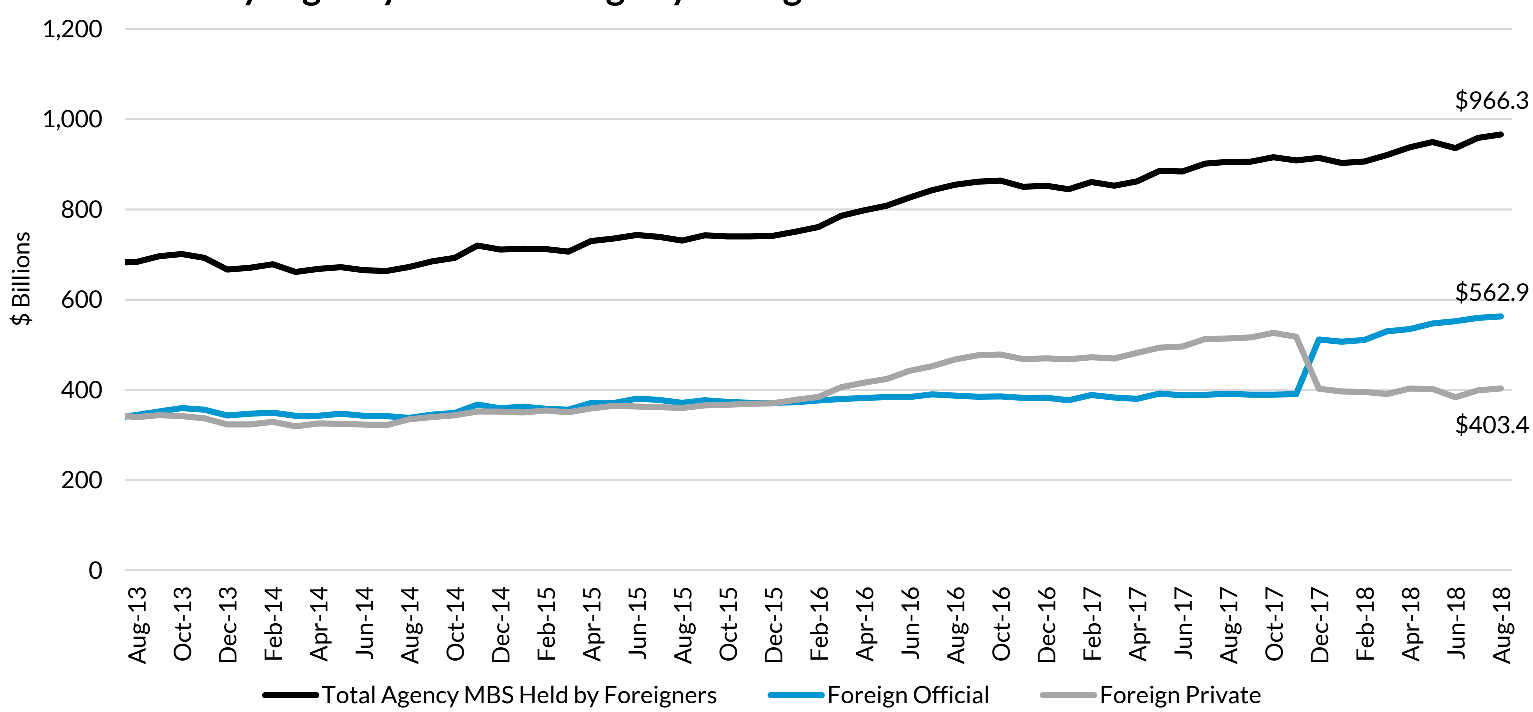
Foreign investors held 14.5 percent of agency MBS in Q2 2018, up from a low of 11.8 percent in Q1 2014. For the month of August 2018, this represents $966.3 billion in Agency MBS; $403.4 billion held by foreign private institutions and $562.9 billion held by foreign official investors.

Foreign Share of Agency MBS



***Sources**: SIFMA and Treasury International Capital (TIC). **Note**: Data as of Q2 2018.*

Monthly Agency MBS Holdings by Foreigners



***Sources**: Treasury International Capital (TIC) and Urban Institute. **Note**: Data as of August 2018. 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 Taiwan, Japan and China; these three comprise around 70 percent of all foreign holdings. Since December 2017, all three of these entities increased their holdings substantially by 18 billion, 20 billion, and 14 billion, respectively, despite the small decline from Japan and China in August.

Agency MBS+ Agency Debt

	Level of Holdings ($Millions)*							Change in Holdings ($Millions)*					
Country	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Jul-18	Aug-18	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Jul-18	Aug-18
Taiwan	227,195	229,030	234,234	245,182	249,451	249,401	251,752	1,835	5,204	10,948	4,269	-50	2,351
Japan	228,466	244,261	241,067	246,344	248,837	263,150	260,930	15,795	-3,194	5,277	2,493	14,313	-2,220
China	183,393	177,580	170,702	173,169	180,820	185,666	184,428	-5,813	-6,878	2,467	7,651	4,846	-1,238
South Korea	46,791	47,581	45,467	44,099	44,167	44,214	44,215	790	-2,114	-1,368	68	47	1
Ireland	44,229	46,648	51,525	49,164	47,662	46,574	48,587	2,419	4,877	-2,361	-1,502	-1,088	2,013
Luxembourg	31,289	33,026	37,575	39,336	37,111	37,210	37,803	1,737	4,549	1,761	-2,225	99	593
Cayman Islands	32,682	29,016	28,374	29,026	29,760	31,455	31,023	-3,666	-642	652	734	1,695	-432
Bermuda	26,767	27,125	28,904	28,055	27,350	27,360	27,683	358	1,779	-849	-705	10	323
Switzerland	17,312	18,675	16,794	13,063	11,813	12,029	11,938	1,363	-1,881	-3,731	-1,250	216	-91
Malaysia	12,365	13,162	12,751	12,139	12,754	13,091	13,043	797	-411	-612	615	337	-48
Rest of World	129,723	124,357	125,465	124,266	122,885	123,373	129,651	-5,366	1,108	-1,199	-1,381	488	6,278
Total	980,212	990,461	992,858	1,003,843	1,012,610	1,033,523	1,041,053	10,249	2,397	10,985	8,767	20,913	7,530

Agency MBS Only (Estimates)

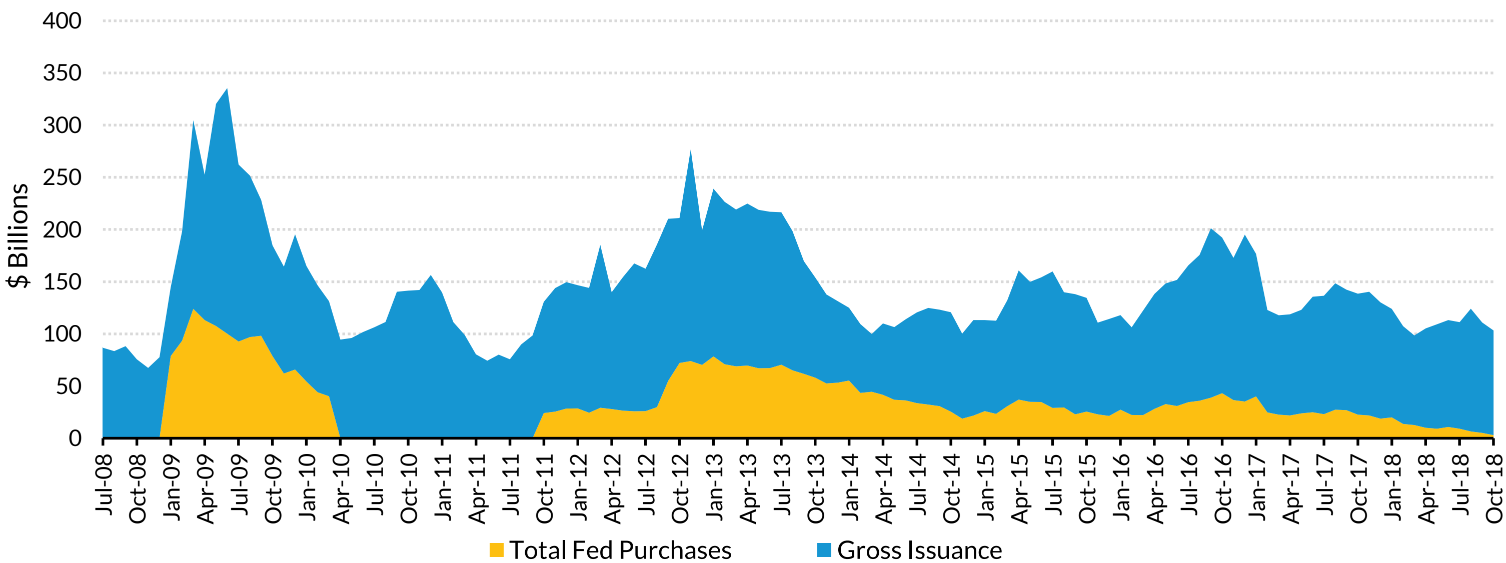
	Level of Holdings ($Millions)*							Change in Holdings ($Millions)*					
Country	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Jul-18	Aug-18	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Jul-18	Aug-18
Taiwan	227,073	228,914	234,127	245,069	249,349	249,299	251,650	1,841	5,213	10,942	4,280	-50	2,351
Japan	221,528	237,689	234,985	239,898	243,028	257,363	255,135	16,161	-2,704	4,914	3,129	14,336	-2,228
China	177,546	172,042	165,576	167,737	175,924	180,789	179,544	-5,504	-6,465	2,161	8,187	4,865	-1,245
South Korea	33,891	35,362	34,158	32,114	33,365	33,455	33,440	1,471	-1,204	-2,044	1,251	89	-15
Ireland	33,663	36,640	42,262	39,348	38,815	37,761	39,761	2,977	5,623	-2,914	-533	-1,054	2,000
Luxembourg	28,314	30,208	34,967	36,572	34,620	34,729	35,318	1,894	4,759	1,605	-1,952	109	589
Cayman Islands	24,897	21,642	21,549	21,793	23,241	24,962	24,520	-3,255	-93	244	1,448	1,720	-441
Bermuda	23,156	23,705	25,738	24,700	24,326	24,348	24,667	549	2,034	-1,038	-374	22	319
Switzerland	13,867	15,412	13,774	9,862	8,928	9,156	9,060	1,545	-1,638	-3,911	-934	227	-95
Malaysia	11,905	12,726	12,348	11,712	12,369	12,707	12,659	821	-379	-636	657	339	-49
Rest of World	94,872	91,345	94,913	91,888	93,703	94,305	100,541	-3,527	3,567	-3,024	1,815	602	6,236
Total	890,712	905,684	914,397	920,694	937,669	958,874	966,296	14,972	8,713	6,297	16,975	21,205	7,422

Sources *:Treasury International Capital (TIC) and Urban Institute.*
Note: **calculated based on June 2017 report with amount asset backed per country. Revised to include Top 10 holders of MBS listed as of June 2017. Monthly data as of August 2018.*

MBS Ownership

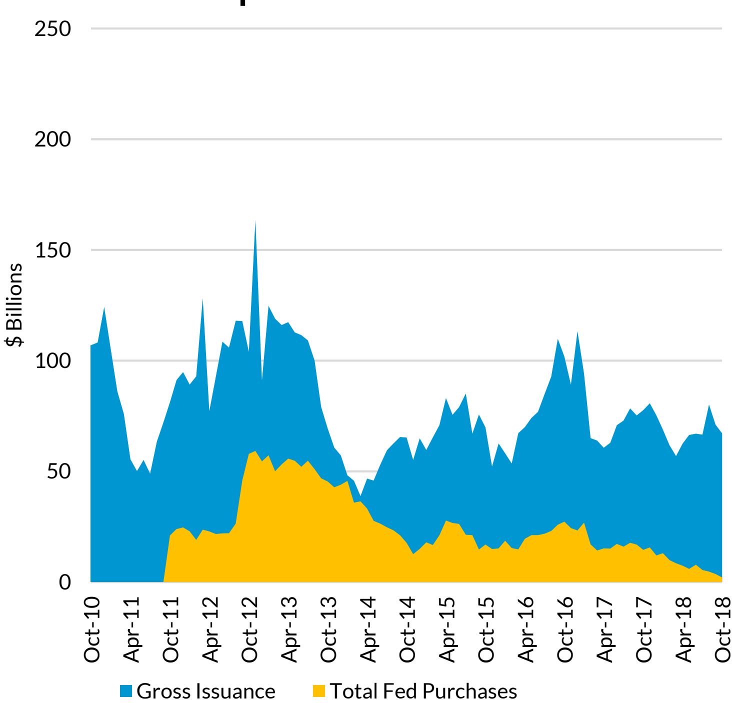
The Fed has begun to wind down their portfolio, and we are beginning to see the effects in slower absorption rates. During the period October 2014-September 2017, the Fed had ended its purchase program, but was reinvesting funds from mortgages and agency debt into the mortgage market, absorbing 20-30 percent of agency gross issuance. With the wind down, which started in October 2017, the Fed will continue to reinvest, but by less than their run off. In October 2018, the Fed reached its maximum taper of $20 billion. Total Fed purchases decreased to $2.9 billion, yielding Fed absorption of gross issuance of 2.9 percent, the lowest level since the Fed began its second mortgage purchase program. The Fed absorbed 2.7 percent of Ginnie Mae issuance and 3.1 percent of GSE issuance.

Total Fed Absorption



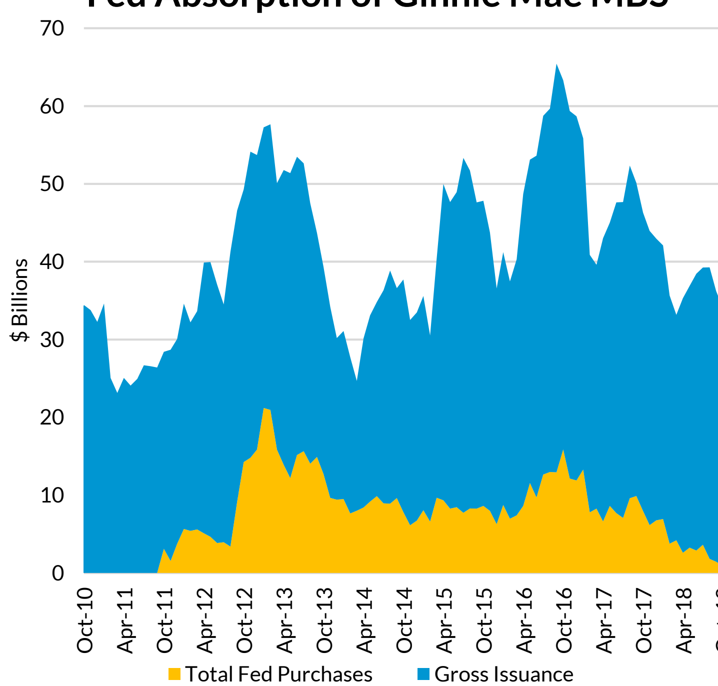
Sources*: eMBS, Federal Reserve Bank of New York and Urban Institute.* ***Note:*** *Data as of October 2018.*

Fed Absorption of GSE MBS



Sources*: eMBS, Federal Reserve Bank of New York and Urban Institute.* ***Note:*** *Data as of October 2018.*

Fed Absorption of Ginnie Mae MBS



Sources*: eMBS, Federal Reserve Bank of New York and Urban Institute.* ***Note:*** *Data as of October 2018.*

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