GLOBAL MARKETS ANALYSIS REPORT

A Monthly Publication of Ginnie Mae's Office of Capital Markets

November 2022

Table of Contents

Inside this Month's Global Market Analysis Report...

This month's *Highlights* section includes a recap of the 2022 Ginnie Mae Global Investor Summit held on November 2nd and 3rd. The Summit included keynote speeches from Alanna McCargo, President of Ginnie Mae and Marcia Fudge, U.S. Secretary of Housing and Urban Development. The two-day Summit also included three panels: Panel I: Global Demand for Mortgage-Backed Securities (MBS), Panel II: Innovation in Housing Finance, and Panel III: ESG (Environmental, Social, and Governance) and Ginnie Mae MBS - Sustainable Investment..

Notable insights in this month's Global Market Analysis Report include the following.

- The Prepayments section illustrates the convergence of Ginnie Mae aggregate prepayment rates to those of Fannie Mae and Freddie Mac (GSE) securities.
- The Agency REMIC issuance section captures the continued upward trend in coupon rates for REMIC deals.
- The Agency Credit Breakdown section illustrates the leading role that Ginnie Mae continues to play in high-LTV lending and in providing homeownership opportunities to first-time homebuyers.
- The U.S. Housing Market section shows signs of decelerating inflation and mortgage rates this month, particularly in the rental housing market, as well as home prices beginning to decline nationally. However, inflation and mortgage rates seem to still outpace wage growth.

Highlights

As a leader in the global capital market, Ginnie Mae hosted the 2022 Global Investor Summit in Washington, DC on November 2nd and 3rd. The Summit took place at the U.S. Department of Housing and Urban Development in the Brooke Mondale Auditorium of the Robert C. Weaver Federal Building. The forum included domestic and international guests from central banks, sovereign wealth funds, public pensions, insurance companies, investment banks, global asset management firms, fixed-income managers, and housing finance policymakers and professionals. International guests included representatives from the following countries: Taiwan, the Philippines, Indonesia, Japan, South Korea, Saudi Arabia, and Singapore. Approximately 100 people attended the Summit, with 25 percent of attendees based abroad. The summit entailed keynote speeches, a "Global Roundtable," a networking reception event and three panels.

The first day of the Summit commenced with the "Global Roundtable: Mortgage-Backed securities and Risk Management." Alanna McCargo, Ginnie Mae President, facilitated the conversation alongside other key Ginnie Mae leaders where leading institutional investors and housing finance policymakers and professionals were invited to exchange perspectives surrounding the risks and opportunities that face our dynamic global capital markets.

Alanna McCargo, President of Ginnie Mae, provides her opening remarks.

Specifically, the roundtable brought attention to securities' prepayment speeds continuing to decline in October as a result of slowing home purchase activity as illustrated in **Section 4**. In addition, roundtable participants pointed out a sharp slowdown in demand from banks for MBS, as shown in **Sections 8.1 and 8.2.** Although panelists did not believe that Fed sales of MBS are imminent or could occur in the near future, the pullback from the Fed in MBS purchases has also led to spreads widening. Participants also emphasized the effect of increasing interest rates on the supply of mortgage originations, which are projected by the Mortgage Bankers Association to decline from $4.4 trillion in 2021 to $2.2 trillion in 2022.

Marcia Fudge, U.S. Secretary of Housing and Urban Development, during her keynote speech.

The second day of the summit opened with remarks from the following keynote speakers: Marcia Fudge, the U.S. Secretary of Housing and Urban Development, Alanna McCargo, Ginnie Mae President, Fabrice Susini, the CEO of the Saudi Real Estate Refinance Company, and Shinji Mouri, President of the Japan Housing Finance Agency.

Once the opening remarks concluded, the first panel to take the stage was "Panel I: Global Demand for Mortgage-Backed Securities (MBS)" with Alven Lam, Managing Director International Markets at Ginnie Mae, moderating, joined by experts from Morgan Stanley, Brean Capital, Bank of America, the World Bank Treasury, Wells Fargo, and Amherst Pierpont Securities. The panelists answered questions related to evolving sources of global demand for MBS (See **Section 1.1**), the top international holders of US MBS as illustrated in **Figure 1** (See **Section 8.4**), the impact on global demand from the changing interest rate environment (See **Section 8.3**), changes in MBS prepayments (See **Section 4**), and the Fed's MBS portfolio pivoting from acquisition to runoff.

Figure 1. Agency MBS

Country	*Level of Holdings ($ Millions)*		
	6/1/2021	***6/1/2022***	***YoY Change in Holdings ($ Millions)***
Japan	311,576	252,455	-59,121
China	217,858	244,266	26,408
Taiwan	249,984	222,670	-27,314
Canada	81,353	75,998	-5,355
United Kingdom	40,857	65,393	24,536
Luxembourg	37,756	42,207	4,451
South Korea	43,433	37,934	-5,499
Cayman Islands	36,254	33,984	-2,270
Ireland	21,839	19,838	-2,001
Switzerland	23,813	19,634	-4,179
Other	196,666	192,354	-4,312
Total	**1,261,389**	**1,206,733**	**-54,656**

After the discussing global demand for MBS, John Getchis, Senior Vice President of the Office of Capital Markets at Ginnie Mae, moderated "Panel II: Innovation in Housing Finance." Mr. Getchis was joined by panelists from the Federal Housing Agency, Ginnie Mae, Mortgage Bankers Association, Wells Fargo, and Greystone with topics encompassing the impact of technological advances on single-family and multifamily originations in the secondary market (See **Section 5**), the effect(s) of technological advances on the MBS market (See **Section 8**) innovation within their respective organizations and operating environment, and challenges or benefits from innovation for institutional MBS investors.

Dialogue around innovation in housing finance continued in the conversations of the final panel, "Panel III: ESG (Environmental, Social, and Governance) and Ginnie Mae MBS - Sustainable Investment." Sam Valverde, Executive Vice President and Chief Operating Officer of Ginnie Mae, moderated the closing panel with questions around the connection between Ginnie Mae MBS and sustainable investment, Ginnie Mae's differing approach in supporting ESG investment compared to Fannie Mae and Freddie Mac, and Ginnie Mae's newest ESG additions to MBS disclosures for investor evaluations. These questions were posed to panelists from the Japan Housing Finance Agency, The World Bank, PwC and Morgan Stanley.

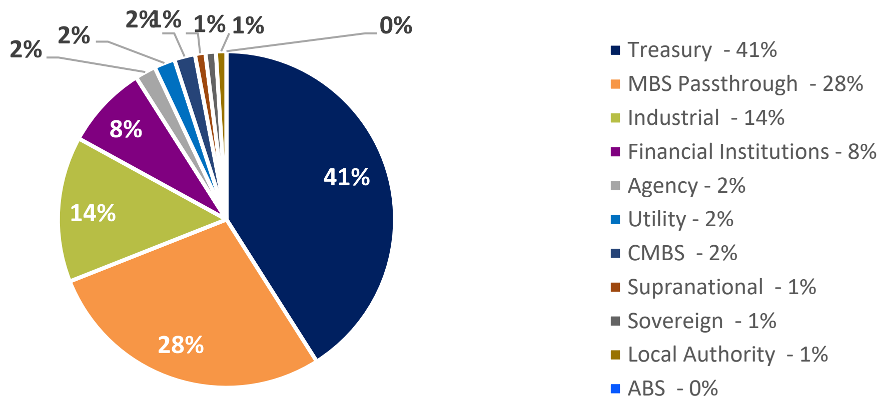
To address ESG developments in housing finance, concerns were raised about a lack of housing affordability. Ginnie Mae's inherent ESG nature of serving first-time home buyers and low-to-moderate income, rural, tribal, and veteran borrowers was highlighted in fostering a more equitable housing finance environment—a mission that is fundamentally focused on the "social" aspect of ESG.

The 2022 Ginnie Mae Global Investor Summit was an opportunity for Ginnie Mae leadership and top professionals in the international housing finance industry to come together and promote discourse around issues and policies related to Ginnie Mae products and the overall trends in the housing market.

1 US AGGREGATE AND GLOBAL INDICES

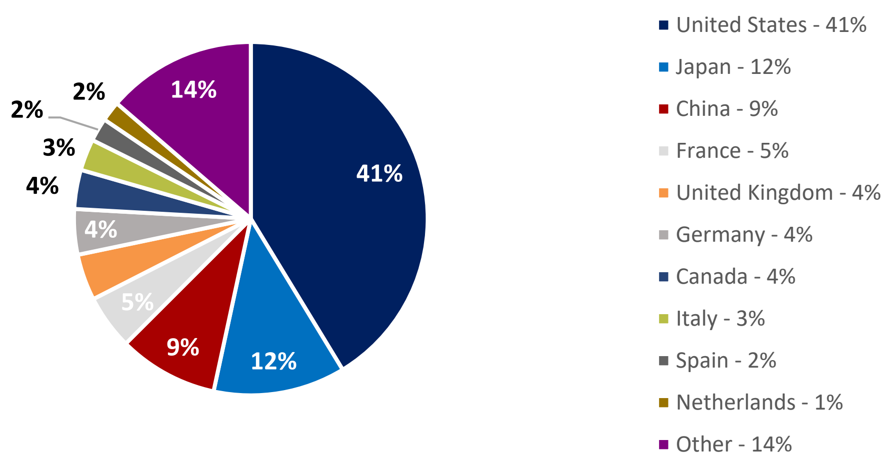
1.1 Bloomberg US Aggregate and Global Indices

Figure 2. Bloomberg US Aggregate Index.



As of month's end October, US Treasuries contributed approximately 41% to the Bloomberg US Aggregate Index, stable from the prior month. US MBS (Ginnie Mae, Fannie Mae, and Freddie Mac) continues to contribute approximately 28%. For the US Aggregate Index, all other changes to the index components were no larger than 1%.

Figure 3. Bloomberg Global Aggregate Index by Country.



In the Bloomberg Global Aggregate Index by Country, the US share of fixed income remains the largest share of total outstanding issuance, representing approximately 41% of the total Bloomberg Global Aggregate Index. Japan's share of fixed income is the second highest at 12%, decreasing from 13% compared to last month. For the Global Aggregate Index, all countries remained stable when compared to the prior month.

Source: Bloomberg [both charts]. Note: Data as of November 2022. Figures in charts may not add to 100% due to rounding.

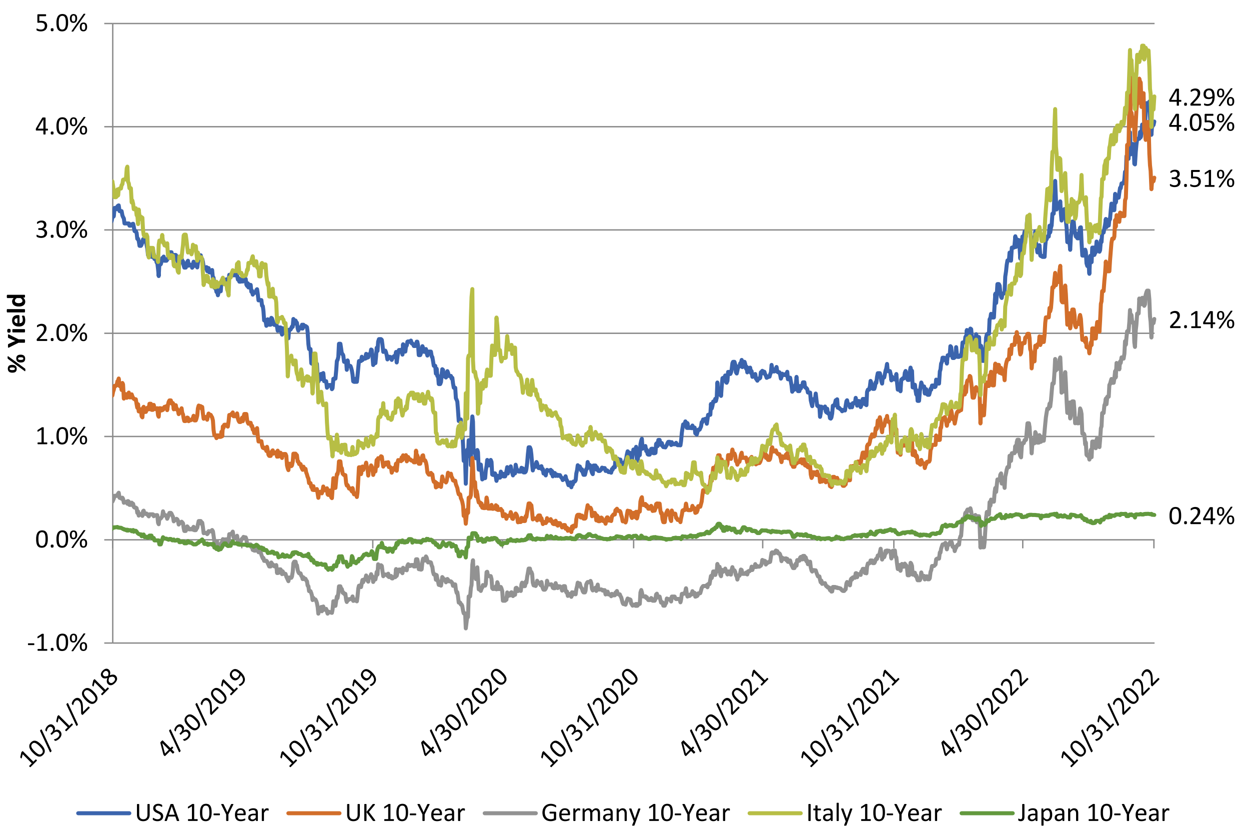
2 SOVEREIGN DEBT PRODUCT PERFORMANCE COMPARISONS

2.1 Global 10-Year Treasury Yields (Unhedged)

The US 10-year Treasury yield moved to 4.05% at month-end October 2022, a MoM increase of 22 bps. US Treasury yields continue to remain second highest of all the government treasury yields depicted in the figure below, behind Italian Treasury yields.

- The yield on the UK 10-year notes decreased to 3.51% at month-end October, a MoM decrease of 57 bps.
- The yield on the German 10-year notes increased to 2.14% at month-end October, a MoM increase of 2 bps.
- The yield on the Italian 10-year note decreased to 4.29% at month-end October, a MoM decrease of 23 bps.
- The yield on the Japanese 10-year notes decreased to 0.24% at month-end October, a MoM decrease of 1 bps.

Figure 4. Global 10-Year Treasury Yields.



Source: Bloomberg. Note: Data as of November 2022.

2.2 US Treasury Hedged Yields

- The hedged yield for the 10-year Treasury JPY decreased MoM 4 bps to 2.12% at month-end October.
- The hedged yield for the 10-year Treasury EUR decreased MoM 3 bps to 1.21% at month-end October.

Figure 5. 7–10yr Total Return Hedged Index, JPY.

Figure 6. 7–10yr Total Return Hedged, EUR.

Source: Bloomberg. Note: Data as of November 2022.

SECONDARY MORTGAGE MARKET

3 FIXED INCOME PRODUCT PERFORMANCE COMPARISONS

3.1 Ginnie Mae Yields – USD

Ginnie Mae fixed rate MBS yields continued to increase MoM in October 2022. Ginnie Mae II yields were at 4.48% at month-end August, increased 108 bps to 5.56% at month-end September and have now increased to 5.72%, a 16 bps increase. Ginnie Mae I yields were at 4.49% at month-end August, increased 102 bps to 5.51% at month-end September, and have now increased to 5.64%, a 13 bps increase. Ginnie Mae II spreads over the US 10-year Treasury yield, just 27 bps at month-end October 2021, had increased 140 bps to 167 bps over the US 10-year Treasury yield at month-end October 2022. The yields on the Ginnie Mae I SF were 159 bps higher than the US 10-year Treasury yield at month-end October, a decrease in spread of 8 bps MoM but an increase of 111 bps YoY.

Figure 7. Ginnie Mae II SF Yield, USD

Figure 8. Ginnie Mae I SF Yield, USD

Sources Bloomberg. Note: Data as of November 2022

3.2 Ginnie Mae Yield Spreads – Intermediate Credit

The yield differential between US Intermediate Credit and GNMA II 30-year OAS increased by 9 bps to 0.66% at month-end October. The Ginnie Mae II 30-year OAS decreased 4 bps MoM. The US Intermediate credit OAS has decreased 6 bps MoM.

Figure 9. US GNMA II 30yr MBS OAS versus US Intermediate Credit OAS.

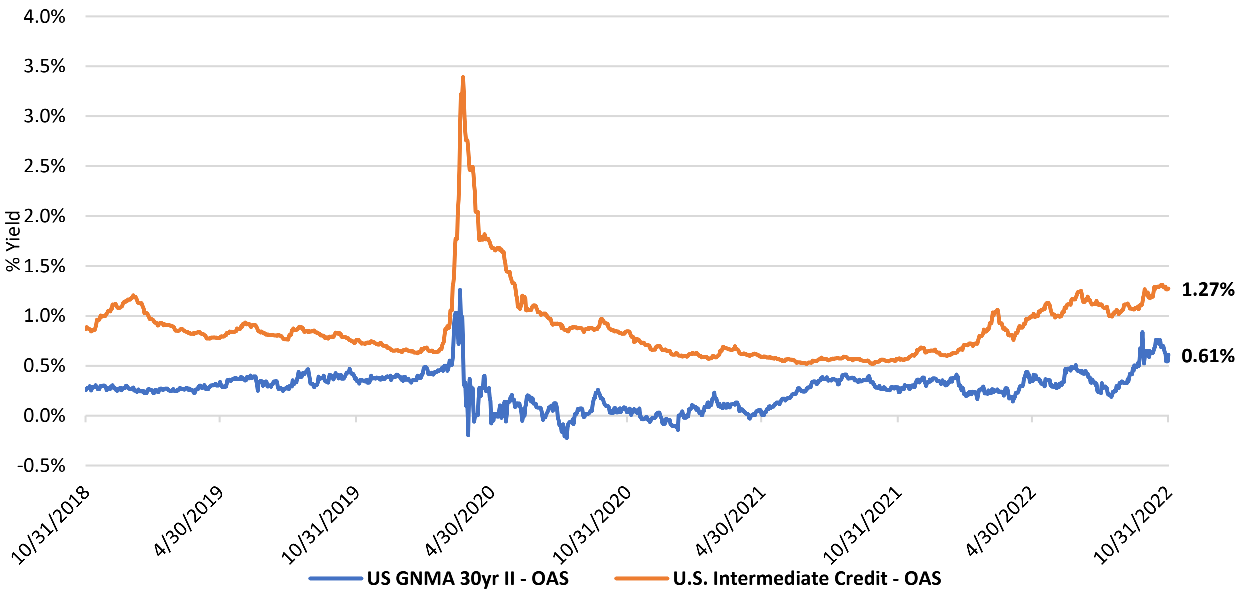


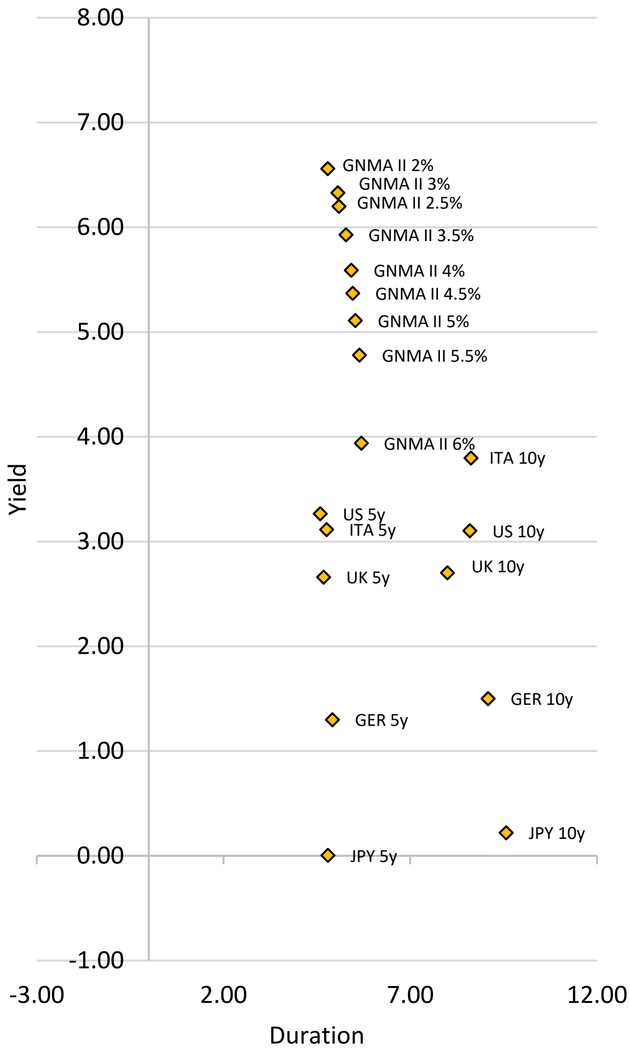
Figure 10. Spread between US Intermediate Credit and US GNMA II 30yr MBS OAS.

Source: Bloomberg. Note: Data as of November 2022.

3.3 Global Treasury Yield Per Duration

GNMA MBS continue to offer a higher yield in comparison to other government fixed income securities of various tenors with similar or longer duration. Prepayment risk is a feature of MBS. Particularly for lower coupon GNMA II securities, increases in duration have been observed relative to the month prior.

Figure 11. Yield vs. Duration



Security	Duration	Yield
US 5y	4.59	3.27
US 10y	8.59	3.10
JPY 5y	4.80	0.01
JPY 10y	9.57	0.22
GER 5y	4.91	1.30
GER 10y	9.08	1.50
ITA 5y	4.76	3.12
ITA 10y	8.63	3.80
UK 5y	4.68	2.66
UK 10y	8.00	2.70
GNMA II 2%	4.79	6.56
GNMA II 2.5%	5.09	6.20
GNMA II 3%	5.06	6.33
GNMA II 3.5%	5.28	5.93
GNMA II 4%	5.42	5.59
GNMA II 4.5%	5.46	5.37
GNMA II 5%	5.53	5.11
GNMA II 5.5%	5.64	4.78
GNMA II 6%	5.69	3.94

Source: Bloomberg. Note: Yield and modified duration for GNMA II securities is based on median prepayment assumptions from surveyed Bloomberg participants. All data is as of October 2022. Yields are in base currency of security and unhedged.

4 PREPAYMENTS

4.1 Aggregate Prepayments (CPR)

Ginnie Mae fixed rate aggregate prepayment speeds decreased in October by 19.9% MoM, while Fannie Mae and Freddie Mac CPRs decreased by 15.7% and 17.3%, respectively. ARM prepayments have dropped for Fannie Mae and Freddie Mac, due to decreased refinance activity in the current higher interest rate environment.

Figure 12. Fixed Rate Aggregate 1-Month CPR.

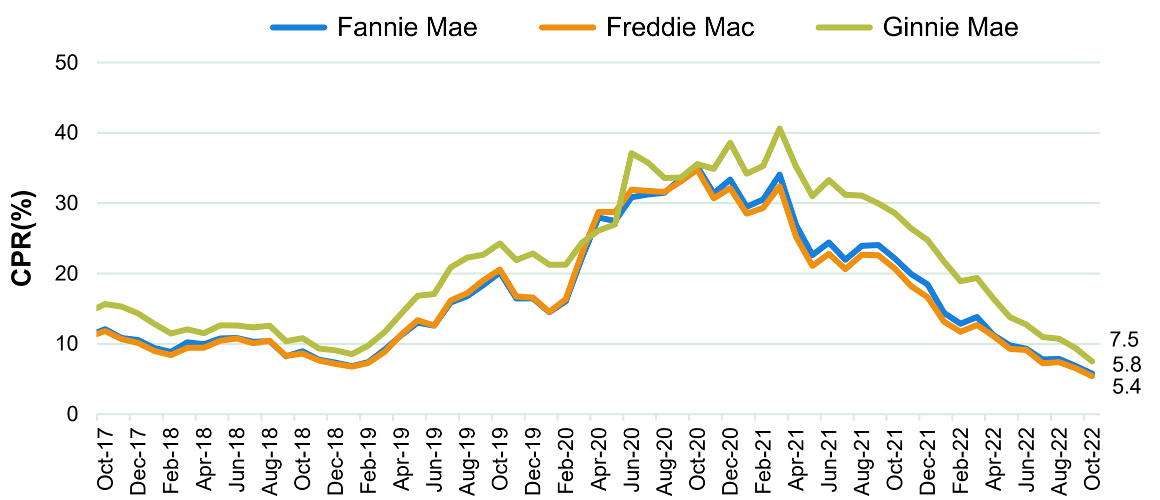
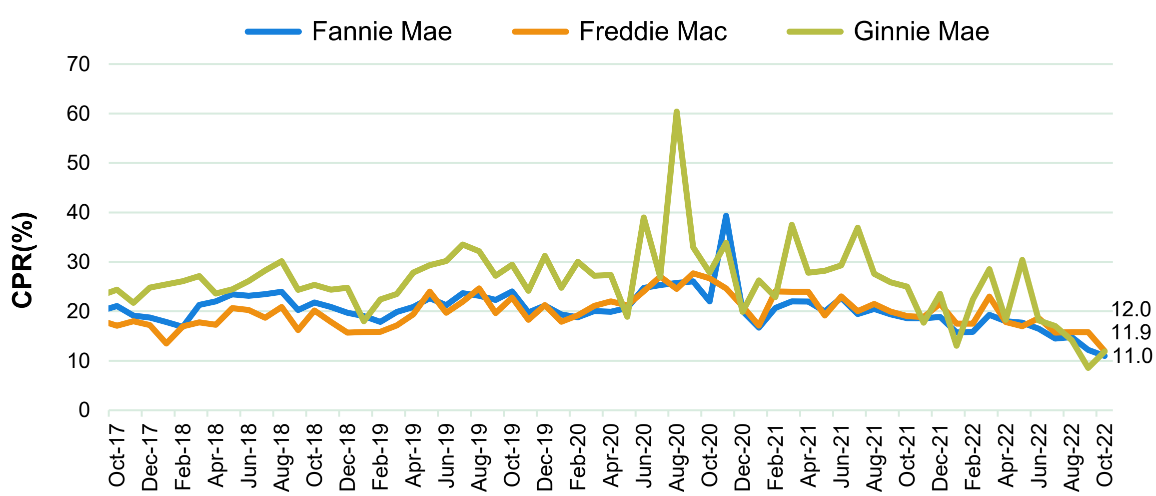


Figure 13. ARM Aggregate 1-Month CPR.



Source: Recursion. Note: Data as of October 2022.

4.2 Involuntary Prepayments (CDR)

Fixed rate involuntary prepayments (CDR) remain higher for Ginnie Mae than for the GSEs. The spread in prepayment speeds between Ginnie Mae's and GSE prepayments has converged significantly since Ginnie Mae's CDR peak of 12.4 CDR in June 2020. ARM CDRs for Freddie Mac dropped below Ginnie Mae in October 2022 after being greater than Ginnie Mae for the month of September.

Figure 14. Fixed Rate Aggregate CDR.

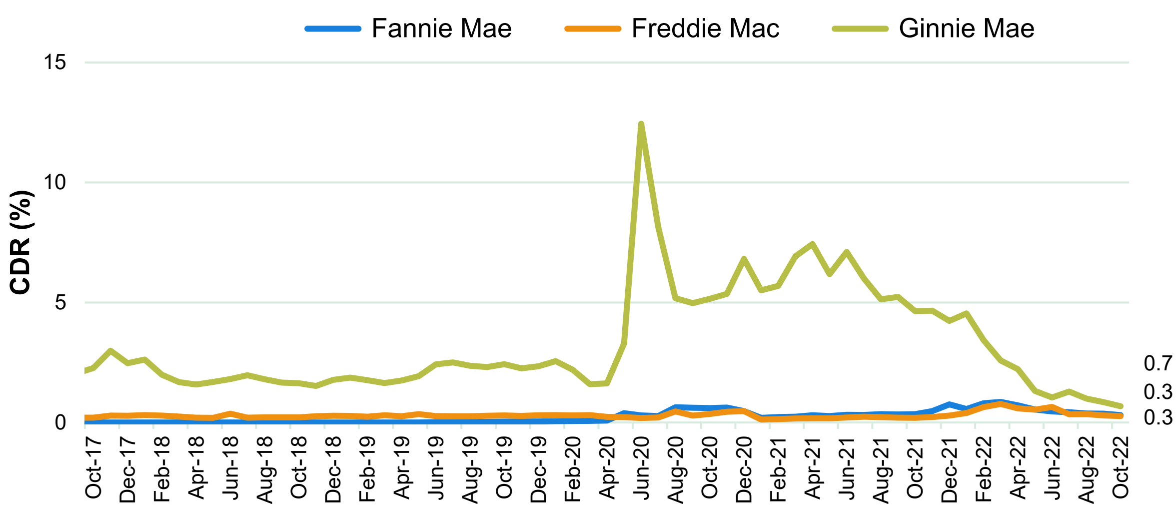
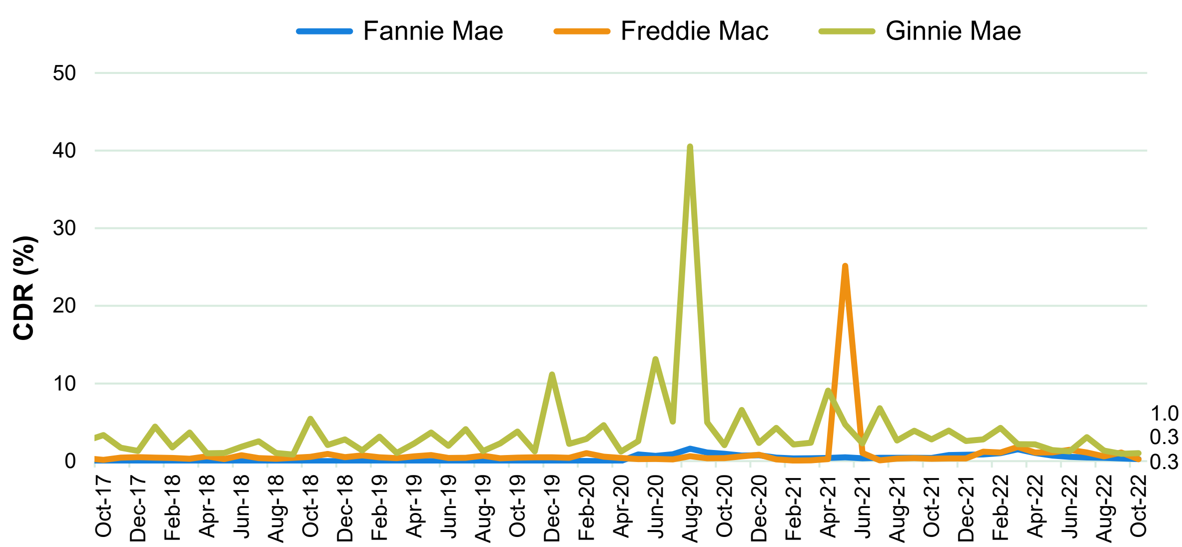


Figure 15. ARM Aggregate CDR.



Source: Recursion. Note: Data as of October 2022.

4.3 Voluntary Prepayment Rates (CRR)

Fixed rate voluntary prepayments (CRR) continue to remain higher for Ginnie Mae relative to the GSEs. In the environment of increasing interest rates and higher prices (See Section 14.2.1), voluntary prepayments are facing downward trends for both Ginnie Mae and the GSEs. Fannie Mae and Freddie Mac saw decreases of 15.8% and 17.6% MoM in fixed rate aggregate CRR, respectively. Freddie Mac saw a 20.9% MoM decrease and Fannie Mae saw a 9.8% MoM decrease in ARM aggregate CRR. Ginnie Mae decreased 20.0% MoM in fixed rate aggregate CRR and saw a 41.6% MoM increase in ARM aggregate CRR. This was the first MoM increase for Ginnie Mae since May 2022.

Figure 16. Fixed Rate Aggregate CRR.

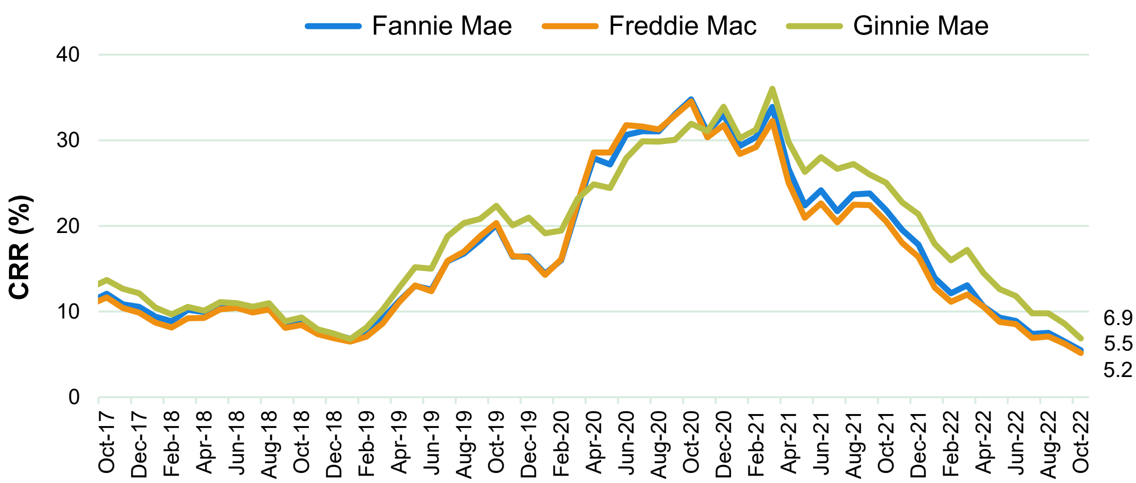
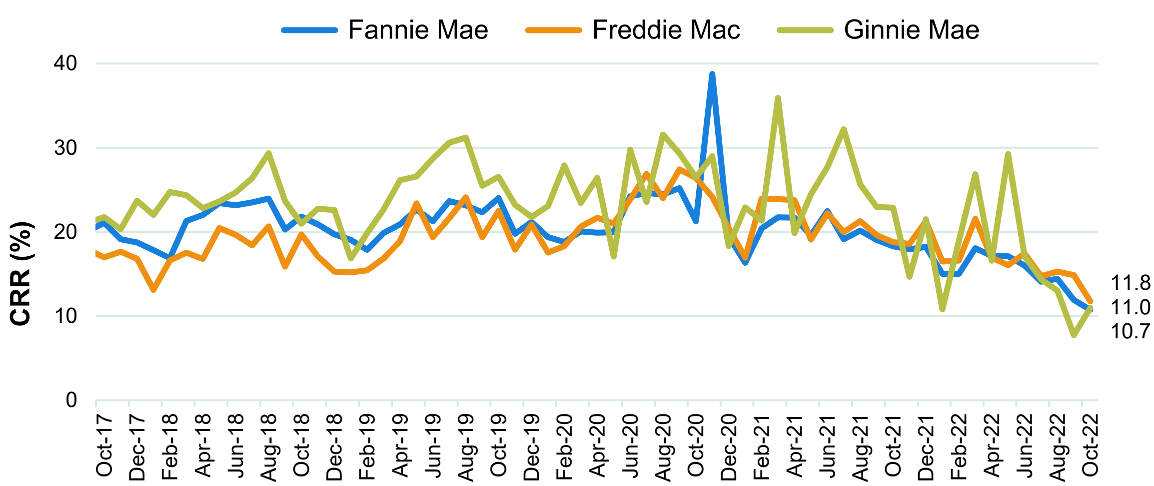


Figure 17. ARM Aggregate CRR.



Source: Recursion. Note: Data as of October 2022.

5 SINGLE-FAMILY MBS PASS-THROUGH ISSUANCE

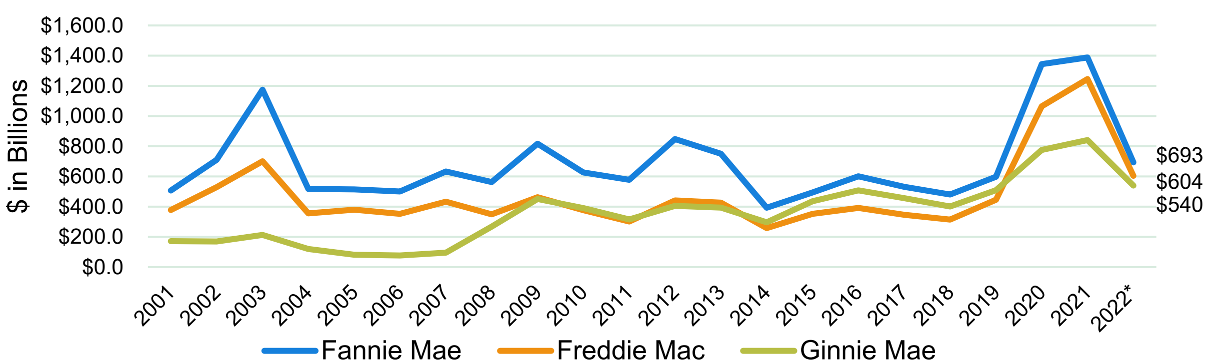
5.1 Gross Issuance of Agency MBS

Agency gross MBS issuance decreased MoM by 18.5%. All three agencies saw decreases in gross issuance as compared to September.

Table 1. Agency Gross Issuance ($ in billions).

Issuance Year	Fannie Mae	Freddie Mac	GSE Total	Ginnie Mae	Total
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	$1,195.6
2019	$597.4	$445.2	$1,042.6	$508.6	$1,551.2
2020	$1,343.4	$1,064.1	$2,407.5	$775.4	$3,182.9
2021	$1,388.0	$1,245.1	$2,633.1	$840.9	$3,474.0
2022 YTD	$577.7	$503.4	$1,081.1	$445.0	$1,531.0
2022 Annualized	$693.2	$604.1	$1,297.3	$540.0	$1,837.2

Figure 18. Agency Gross Issuance



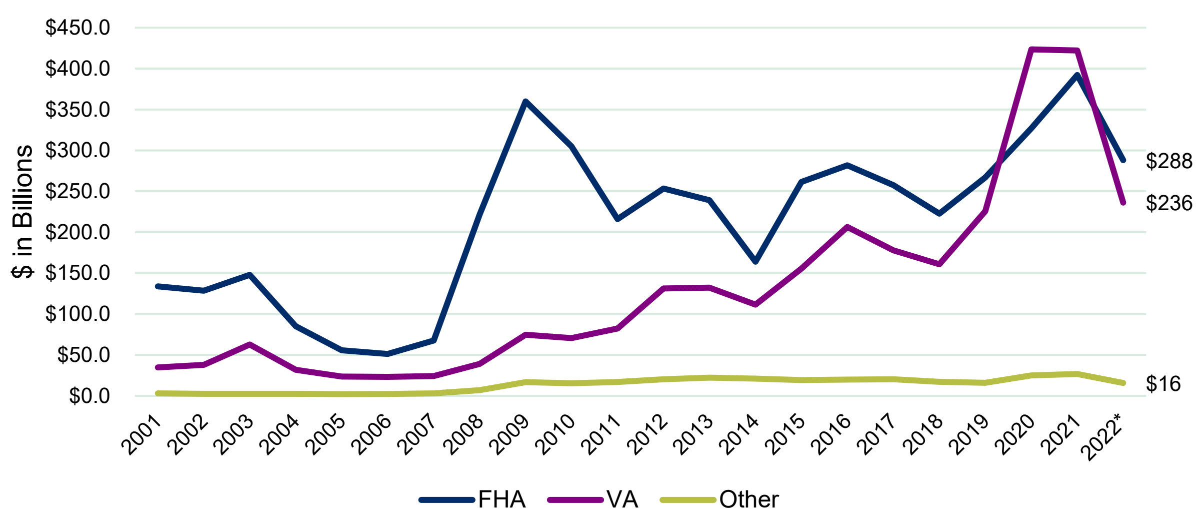
*2022 values have been annualized – the annualization methodology is not seasonally adjusted.
Note: Numbers are rounded to the nearest hundred million. For sums, like "GSE Total", the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

Ginnie Mae's $35.5 billion in gross issuance in October was approximately 49% below the average monthly issuance for 2021. Thus far in 2022, Ginnie Mae is on pace to have lower gross issuance than 2021 by approximately $300.9 billion.

Table 2. Ginnie Mae Gross Issuance Collateral Composition ($ in billions)

Issuance Year	FHA	VA	Other	Total
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	$266.9	$225.7	$16.0	$508.6
2020	$327.0	$423.5	$24.9	$775.4
2021	$392.2	$422.1	$26.7	$840.9
2022 YTD	$240.0	$196.8	$13.2	$450.0
2022 Annualized	$288.0	$236.2	$15.8	$540.0

Figure 19. Ginnie Mae Gross Issuance



*2022 values have been annualized – the annualization methodology is not seasonally adjusted.
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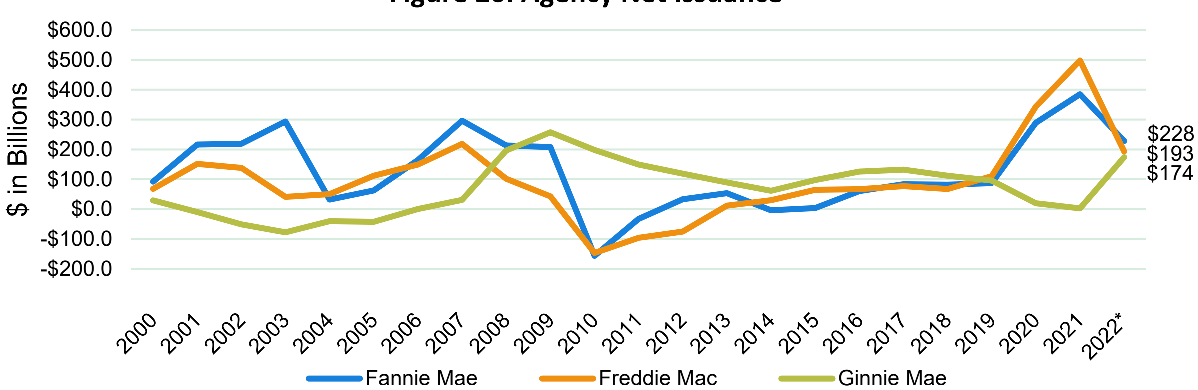
5.2 Net Issuance of Agency MBS

Agency net issuance in October was approximately $27.8 billion, which represents a 30.2% MoM decrease in net issuance. Ginnie Mae net issuance was $17.3 billion in October, a 5.5% decrease from September 2022. Since May 2022, FHA net issuance outpaces VA net issuance MoM, as shown in Table 4 and Figure 21.

Table 3. Agency Net Issuance ($ in billions)

Issuance Year	Fannie Mae	Freddie Mac	GSE	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	$53.5	$11.8	$65.3	$89.6	$154.9
2014	$-4.0	$30.0	$26.0	$61.6	$87.7
2015	$3.5	$65.0	$68.4	$97.3	$165.7
2016	$60.5	$66.8	$127.4	$126.1	$253.5
2017	$83.7	$77.0	$160.7	$132.3	$293.0
2018	$81.9	$67.6	$149.4	$112.0	$261.5
2019	$87.4	$110.3	$197.7	$95.7	$293.5
2020	$289.3	$343.5	$632.8	$19.9	$652.7
2021	$384.9	$498.0	$882.9	$2.7	$885.6
2022 YTD	$190.3	$161.1	$351.3	$145.1	$496.4
2022 Annualized	$228.3	$193.3	$421.6	$174.1	$595.7

Figure 20. Agency Net Issuance

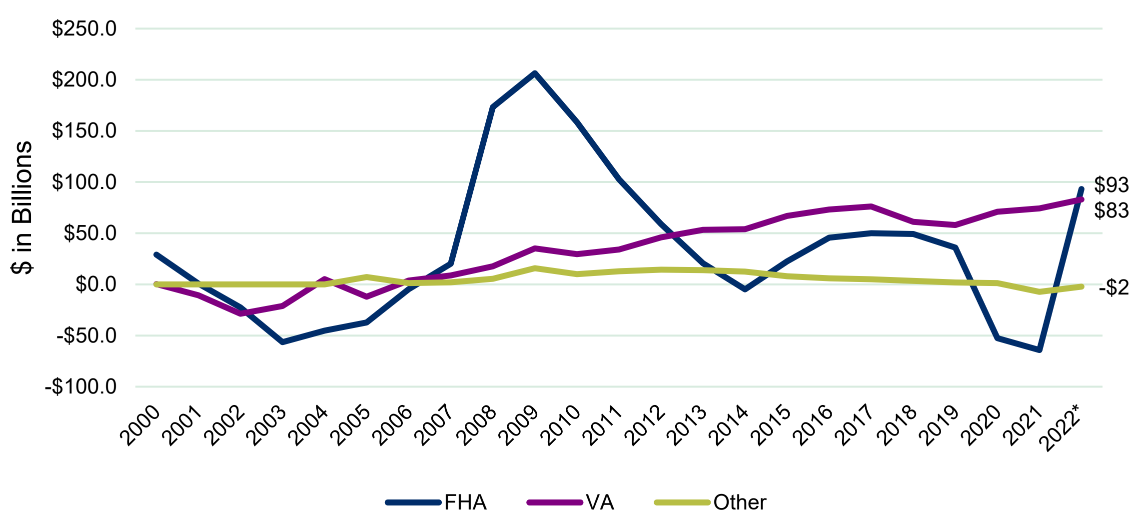


**2022 values have been annualized – the annualization methodology is not seasonally adjusted.*
Note: Numbers are rounded to the nearest hundred million. For sums, like "GSE Total", the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

Table 4. Ginnie Mae Net Issuance Collateral Composition ($ in billions)

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	$131.2
2018	$49.2	$61.2	$3.5	$113.9
2019	$35.9	$58.0	$1.9	$95.7
2020	-$52.5	$71.0	$1.3	$19.9
2021	-$64.2	$74.2	-$7.3	$2.7
2022 YTD	$77.7	$69.2	-$1.8	$145.1
2022 Annualized	$93.3	$83.0	-$2.1	$174.1

Figure 21. Ginnie Mae Net Issuance



*2022 values have been annualized – the annualization methodology is not seasonally adjusted.
Note: Numbers are rounded to the nearest hundred million. For sums, like "GSE Total", the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

5.3 Monthly Issuance Breakdown

Table 5. Ginnie Mae Net Issuance Collateral Composition ($ in billions)

	Agency Gross Issuance Amount (in $ Billions)					Agency Net Issuance Amount (in $ Billions)				
Month	Fannie Mae	Freddie Mac	Ginnie Mae	GSEs	Total	Fannie Mae	Freddie Mac	Ginnie Mae	GSEs	Total
Oct-18	$39.8	$27.4	$33.2	$67.1	$100.3	$9.7	$7.1	$11.4	$16.8	$28.2
Nov-18	$35.1	$30.1	$32.4	$65.2	$97.6	$3.6	$11.0	$9.8	$14.6	$24.4
Dec-18	$36.9	$23.9	$28.4	$60.7	$89.1	$8.2	$6.4	$8.2	$14.6	$22.8
Jan-19	$33.3	$19.2	$29.0	$52.6	$81.6	$5.9	$2.5	$9.2	$8.3	$17.6
Feb-19	$27.3	$19.9	$23.5	$47.2	$70.7	$1.4	$3.4	$4.6	$4.7	$9.3
Mar-19	$29.6	$27.3	$26.6	$56.9	$83.5	$1.8	$10.3	$5.6	$12.0	$17.6
Apr-19	$33.1	$30.8	$32.9	$63.9	$96.8	$1.3	$10.8	$8.3	$12.0	$20.4
May-19	$44.5	$34.3	$38.8	$78.8	$117.6	$6.7	$9.8	$9.4	$16.6	$26.0
Jun-19	$44.6	$34.0	$43.3	$78.6	$121.9	$1.9	$5.9	$9.0	$7.8	$16.8
Jul-19	$51.7	$36.9	$45.9	$88.6	$134.5	$10.9	$10.1	$11.0	$21.0	$32.0
Aug-19	$71.1	$50.4	$51.2	$121.4	$172.6	$20.8	$17.1	$8.7	$37.9	$46.6
Sep-19	$67.1	$43.0	$52.0	$110.1	$162.1	$14.1	$7.5	$6.5	$21.5	$28.0
Oct-19	$65.0	$46.2	$58.4	$111.2	$169.6	$7.4	$7.1	$11.9	$14.6	$26.5
Nov-19	$68.1	$50.7	$54.3	$118.7	$173.1	$5.2	$8.6	$4.1	$13.8	$18.0
Dec-19	$62.1	$52.5	$52.7	$114.6	$167.3	$10.1	$17.3	$7.4	$27.3	$34.7
Jan-20	$61.7	$51.4	$56.0	$113.1	$169.0	$9.1	$16.5	$8.6	$25.6	$34.2
Feb-20	$56.5	$39.5	$51.2	$96.0	$147.2	$9.4	$7.9	$7.1	$17.4	$24.4
Mar-20	$69.5	$41.4	$53.0	$110.8	$163.9	$17.9	$6.3	$8.8	$24.2	$33.0
Apr-20	$101.6	$76.3	$61.4	$177.9	$239.3	$30.5	$27.5	$10.2	$58.0	$68.2
May-20	$124.3	$70.6	$60.8	$194.9	$255.7	$35.2	$8.2	$5.7	$43.4	$49.1
Jun-20	$118.9	$78.1	$58.5	$197.0	$255.4	$30.0	$15.9	$1.3	$45.9	$47.2
Jul-20	$125.0	$108.1	$66.5	$233.1	$299.5	$23.4	$38.0	-$15.5	$61.4	$45.9
Aug-20	$137.6	$113.6	$73.6	$251.3	$324.8	$34.2	$43.4	-$4.1	$77.6	$73.5
Sep-20	$122.9	$102.1	$72.4	$225.0	$297.5	$16.5	$29.9	$1.0	$46.5	$47.5
Oct-20	$142.3	$124.8	$72.6	$267.1	$339.7	$28.9	$48.3	-$0.3	$77.2	$76.9
Nov-20	$152.4	$131.5	$72.6	$283.9	$356.5	$31.4	$48.4	-$4.5	$79.8	$75.3
Dec-20	$130.8	$126.7	$76.9	$257.5	$334.4	$22.8	$53.1	$1.7	$75.8	$77.5
Jan-21	$141.6	$117.3	$78.2	$258.9	$337.1	$25.9	$37.9	-$6.5	$63.8	$57.3
Feb-21	$118.8	$115.5	$72.3	$234.3	$306.6	$16.8	$44.3	-$0.9	$61.1	$60.2
Mar-21	$143.9	$118.9	$76.9	$262.8	$339.7	$37.6	$44.0	$1.0	$81.6	$82.6
Apr-21	$148.0	$142.3	$85.6	$290.3	$375.9	$26.2	$57.0	-$4.2	$83.3	$79.0
May-21	$132.3	$91.4	$71.7	$223.7	$295.4	$64.9	$38.8	-$3.1	$103.7	$100.6
Jun-21	$108.5	$91.2	$67.7	$199.7	$267.4	$34.0	$33.7	$2.6	$67.8	$70.4
Jul-21	$95.4	$84.6	$69.0	$180.0	$249.0	$27.6	$31.9	-$1.4	$59.5	$58.0
Aug-21	$104.8	$109.3	$66.6	$214.1	$280.8	$27.5	$48.5	$1.4	$76.1	$77.4
Sep-21	$102.9	$105.3	$68.0	$208.3	$276.3	$26.4	$45.6	$3.1	$72.0	$75.1
Oct-21	$105.1	$102.7	$62.5	$207.8	$270.3	$34.6	$46.9	$1.9	$81.5	$83.4
Nov-21	$93.6	$81.1	$60.8	$174.7	$235.5	$29.5	$34.9	$3.1	$64.4	$67.6
Dec-21	$93.7	$85.4	$58.9	$179.1	$238.0	$33.8	$34.4	$5.7	$68.3	$73.9
Jan-22	$93.1	$85.9	$59.0	$179.0	$238.0	$45.6	$37.6	$14.0	$83.2	$97.3
Feb-22	$73.3	$64.6	$49.0	$137.9	$186.9	$27.8	$22.7	$9.7	$50.5	$60.2
Mar-22	$76.8	$62.9	$47.4	$139.7	$187.1	$22.6	$23.1	$6.9	$45.7	$52.6
Apr-22	$65.3	$53.5	$47.8	$118.8	$166.6	$19.5	$17.7	$13.2	$37.2	$50.4
May-22	$54.7	$43.7	$45.0	$98.4	$143.4	$13.6	$12.5	$15.5	$26.1	$41.6
Jun-22	$54.5	$42.0	$43.6	$96.5	$140.1	$14.8	$10.7	$16.0	$25.5	$41.5
Jul-22	$46.8	$40.3	$42.4	$87.1	$129.5	$12.1	$14.4	$18.0	$26.5	$44.5
Aug-22	$39.8	$46.3	$40.3	$86.1	$126.4	$4.8	$19.8	$16.2	$24.6	$40.8
Sep-22	$39.3	$38.2	$39.9	$77.5	$117.4	$7.6	$13.9	$18.3	$21.5	$39.8
Oct-22	$34.1	$26.1	$35.5	$60.2	$95.7	$5.8	$4.7	$17.3	$10.5	$27.8

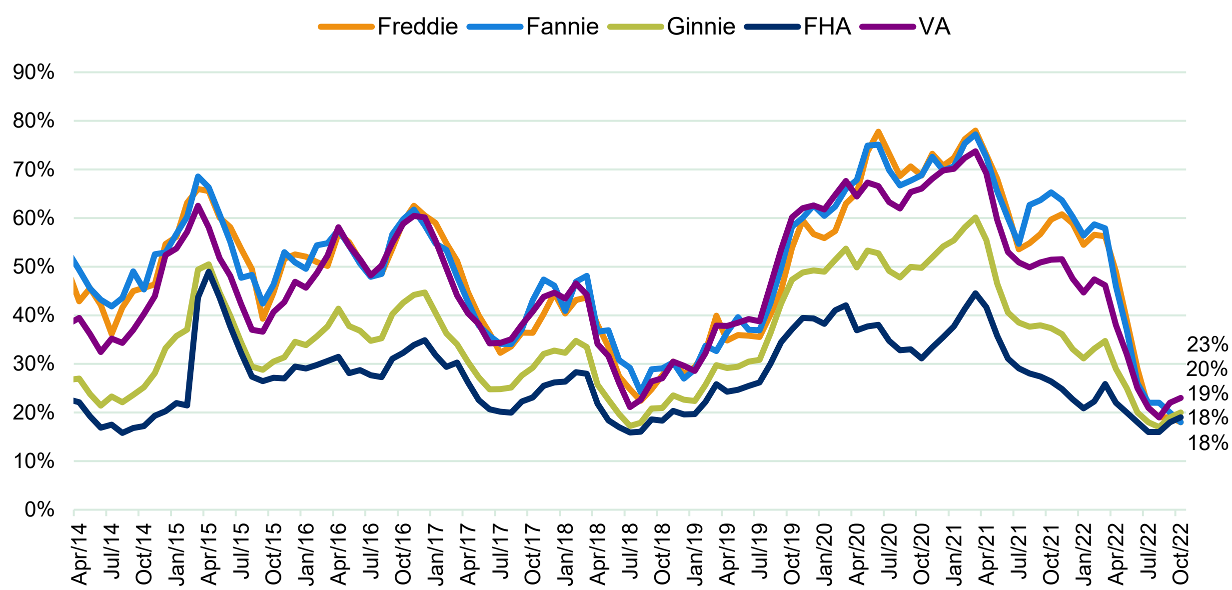
Source: Beginning May 2021, data for Gross and Net Issuance was sourced from Fannie Mae, Freddie Mac, and Ginnie Mae loan level disclosure files. Net issuance is defined here as the difference between prior period UPB and current period UPB. Data as of October 2022. Beginning with the October 2021 GMAR, the Fannie Mae and Freddie Mac net issuance data have been updated to reflect the current UPB of the portfolios. July 2021 through October 2022 GMAR net issuance data reflect the UPB at security issuance for Fannie Mae and Freddie Mac. Note: Numbers are rounded to the nearest hundred million.

5.4 Percent Refi at Issuance – Single-Family

Refinance activity has increased for Ginnie Mae in October. In the conventional mortgage market space, Fannie Mae saw a decline of approximately 10% MoM while Freddie Mac's refinance share decreased 5% MoM. Ginnie Mae's MoM increase was approximately 5%, with the greater rise taking place with FHA lending which was up almost 6% in October MoM. VA's refinance share increased by approximately 5%.

- Freddie Mac's refinance percentage dropped to 18% in October, down from 19% in September.
- Fannie Mae's refinance percentage dropped to 18% in October, down from 20% in September.
- Ginnie Mae's refinance percentage increased to 20% in October, up from 19% in September.
- FHA's refinance percentage increased to 19% in October, up from 18% in September.
- VA's refinance percentage increased to 23% in October, up from 22% in September.

Figure 22. Percent Refinance at Issuance – Single-Family.



Sources: Recursion. Note: Data as of October 2022.

6 AGENCY SINGLE-FAMILY MBS OUTSTANDING

6.1 Outstanding Single-Family Agency MBS

As of October 2022, outstanding single-family MBS in the agency market totaled $8.560 trillion: 41.8% Fannie Mae, 33.7% Freddie Mac, and 24.5% Ginnie Mae MBS. Over the past twelve months, Freddie Mac's, Fannie Mae's, and Ginnie Mae's total outstanding MBS increased by approximately 9.4%, 6.1% and 8.3%, respectively. Fannie Mae outstanding MBS remains larger than Freddie Mac's and Ginnie Mae's by approximately $688 billion and $1.5 trillion, respectively.

Ginnie Mae MBS collateral composition has changed dramatically over the past five years. In October 2017, 61.1% of Ginnie Mae outstanding collateral was FHA and 32.6% was VA. In October 2022, FHA collateral comprised 52.7% of Ginnie Mae MBS outstanding and VA collateral comprised 42.3% of Ginnie Mae MBS outstanding.

Figure 23. Outstanding Agency Mortgage-Backed Securities.

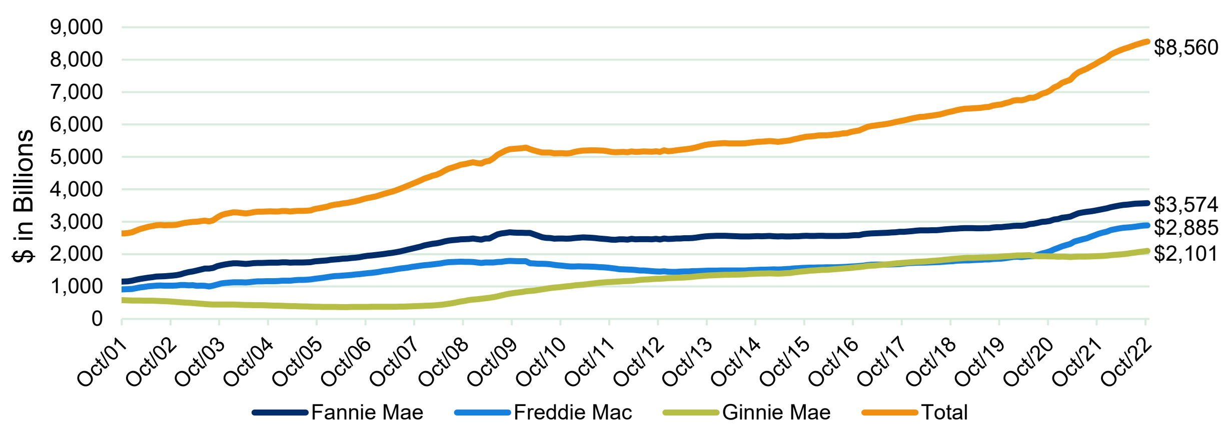
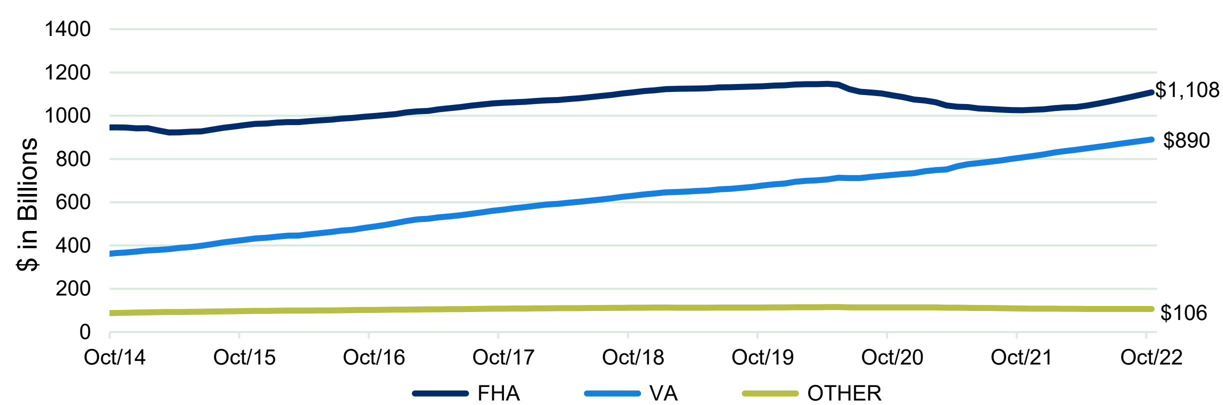


Figure 24. Composition of Outstanding Ginnie Mae Mortgage-Backed Securities.



Sources: Recursion. Note: Data as of October 2022.

6.2 Origination Volume and Share Over Time

Origination volume continued to decline in Q3 2022, with $505 billion in originations in Q3, which represents a decline in issuance from Q2 2022 of approximately 22%. Ginnie Mae's share of total origination increased from 17.8% to 21.6% in Q3 2022, while Portfolio origination decreased from 30.8% to 26.4% in Q3 2022.

Figure 25. First Lien Origination Volume

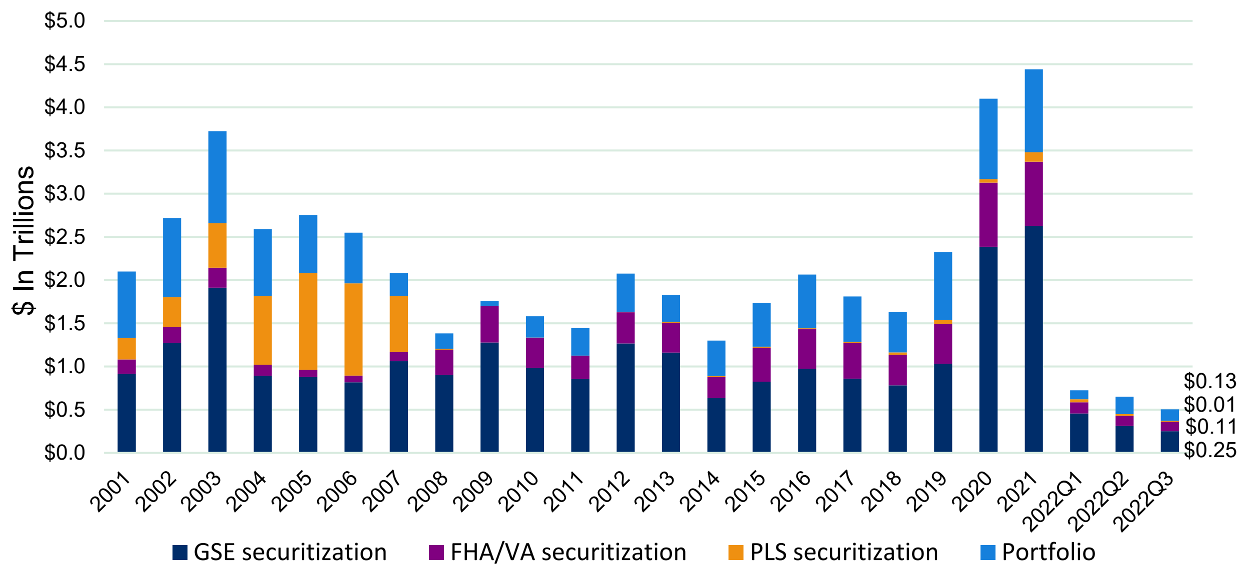
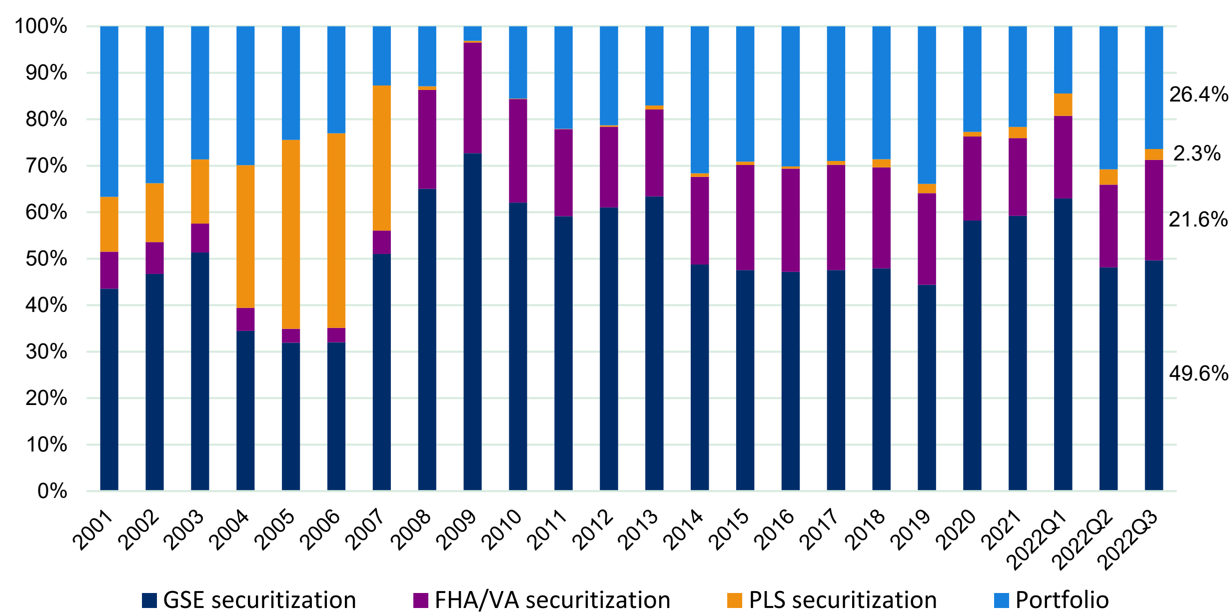


Figure 26. First Lien Origination Share



Source: Inside Mortgage Finance. Note: Data as of Q3 2022.

6.3 Agency Issuance and Agency Outstanding by State

Ginnie Mae MBS represent approximately 28% of new agency issuance over the past year. The share of Ginnie Mae's new agency issuance varies across states, with the highest Ginnie Mae share being in Alaska (51%) and the lowest in the District of Columbia (17%). The highest Ginnie Mae outstanding share is in Alaska and Mississippi (47%) and the lowest still in the District of Columbia (13%). There is currently a 3% difference between Ginnie Mae's share of new agency issuance and Ginnie Mae's share of agency outstanding.

Table 6. Agency Issuance Breakdown by State

	Agency Issuance (past 1 year)				Agency Outstanding			
National	GNMA Share	GNMA Loan Count	GNMA Avg. Loan Size (000)	GSE Avg. Loan Size (000)	GNMA Share by UPB	GNMA Loan Count	GNMA Avg. Loan Size (000)	GSE Avg. Loan Size (000)
	28%	2,619,558	274.79	282.13	25%	10,568,064	203.33	210.97
AK	51%	8,906	328.99	294.08	47%	37,114	261.19	221.75
AL	41%	56,524	217.12	232.03	40%	233,269	155.59	177.58
AR	38%	30,530	185.77	214.56	38%	135,436	131.23	160.84
AZ	25%	79,502	303.23	309.10	24%	268,337	216.68	225.49
CA	20%	184,606	432.44	424.35	16%	672,629	325.79	321.55
CO	26%	60,728	388.02	370.21	23%	210,800	289.50	277.38
CT	28%	25,059	258.44	274.78	25%	104,472	201.53	210.01
DC	17%	2,095	500.15	430.15	13%	8,813	381.23	351.74
DE	32%	12,883	261.65	282.33	31%	50,988	203.13	211.26
FL	32%	228,810	281.43	284.22	31%	833,545	209.49	210.68
GA	34%	132,278	245.02	277.65	33%	489,777	177.85	206.32
HI	38%	8,627	610.14	485.26	31%	33,192	469.22	359.28
IA	25%	17,887	180.82	195.22	22%	81,438	133.23	148.96
ID	24%	15,565	325.84	312.85	23%	62,726	215.77	222.62
IL	24%	88,148	207.40	240.71	22%	360,527	159.22	179.81
IN	31%	66,040	185.39	203.69	30%	275,081	132.80	150.73
KS	30%	21,154	190.73	219.54	29%	95,296	139.19	164.09
KY	35%	38,885	193.50	209.79	34%	162,607	142.58	156.01
LA	44%	47,312	203.12	232.53	40%	197,731	157.24	177.97
MA	20%	29,551	366.20	360.94	16%	111,916	283.45	269.88
MD	37%	74,485	332.48	322.68	33%	287,999	264.62	250.38
ME	27%	9,022	238.29	262.14	25%	37,328	176.59	192.04
MI	21%	63,661	183.55	211.26	20%	271,206	132.90	157.26
MN	19%	34,895	242.70	268.11	18%	157,898	181.55	198.88
MO	30%	55,698	194.29	215.68	28%	241,446	141.17	162.32
MS	48%	27,978	197.35	211.64	47%	120,743	142.54	161.34
MT	24%	7,317	297.64	303.27	23%	32,005	207.48	216.36
NC	29%	103,476	241.59	274.46	28%	407,942	173.96	201.73
ND	29%	4,195	243.07	239.80	24%	16,863	193.12	185.36
NE	27%	13,403	212.45	215.36	26%	64,144	148.03	161.24
NH	23%	8,823	300.89	296.43	22%	37,803	225.16	215.32
NJ	25%	59,206	308.69	329.11	21%	228,174	239.13	255.29
NM	37%	20,718	233.49	243.41	37%	93,972	165.49	178.30
NV	31%	38,053	329.80	318.10	30%	130,498	246.12	235.07
NY	21%	59,029	302.32	340.01	20%	302,981	208.20	248.85
OH	29%	94,100	178.88	199.49	29%	417,243	129.40	149.37
OK	40%	39,867	197.21	216.03	41%	186,862	140.13	162.20
OR	21%	28,004	342.61	347.88	19%	109,077	252.67	253.79
PA	24%	77,625	198.88	242.94	25%	383,637	148.40	182.40
RI	34%	9,115	310.67	290.17	29%	35,031	232.62	213.70
SC	35%	63,486	243.89	254.43	33%	230,554	181.70	192.03
SD	31%	6,505	237.51	237.26	29%	28,961	172.23	178.08
TN	30%	67,486	249.41	271.64	31%	266,372	173.66	203.99
TX	29%	251,100	253.57	288.08	31%	1,071,746	180.26	211.86
UT	20%	25,949	362.19	363.23	18%	93,952	257.74	263.57
VA	40%	109,962	327.16	315.83	36%	440,416	256.23	251.02
VI	20%	147	379.09	411.74	23%	782	246.62	302.38
VT	20%	2,545	236.19	257.64	18%	11,958	180.85	180.88
WA	24%	59,806	387.64	388.27	21%	229,318	283.24	289.78
WI	19%	28,702	206.97	224.12	17%	122,093	156.11	164.00
WV	45%	13,777	192.27	194.35	43%	58,591	143.54	145.67
WY	36%	6,333	260.82	262.43	34%	24,775	205.67	202.16

Source: Recursion. Note: Outstanding balance is based on loan balance as of October 2022. Ginnie Mae issuance is based on the last 12 months, from September 2021 to October 2022. Values above are based on loan level disclosure data, thus excluding loan balances for the first six months that loans are in a pool. This accounts for the difference in share of outstanding MBS represented above and in Outstanding Single-Family Agency MBS.

6.4 Outstanding Ginnie Mae MBS Volume by Coupon and Vintage Over Time

As of October 2022, the weighted average coupon (WAC) on outstanding Ginnie Mae MBS increased slightly from 3.01% in September 2022 to 3.04% in October. With 30-year fixed mortgage rates for certain credit profiles at over 6.0% in October, this increase in WAC is likely to continue. The bottom chart illustrates that loans originated since 2019 account for 77% of Ginnie Mae MBS collateral outstanding.

Figure 27. Outstanding Ginnie Mae MBS Balance, by Coupon.

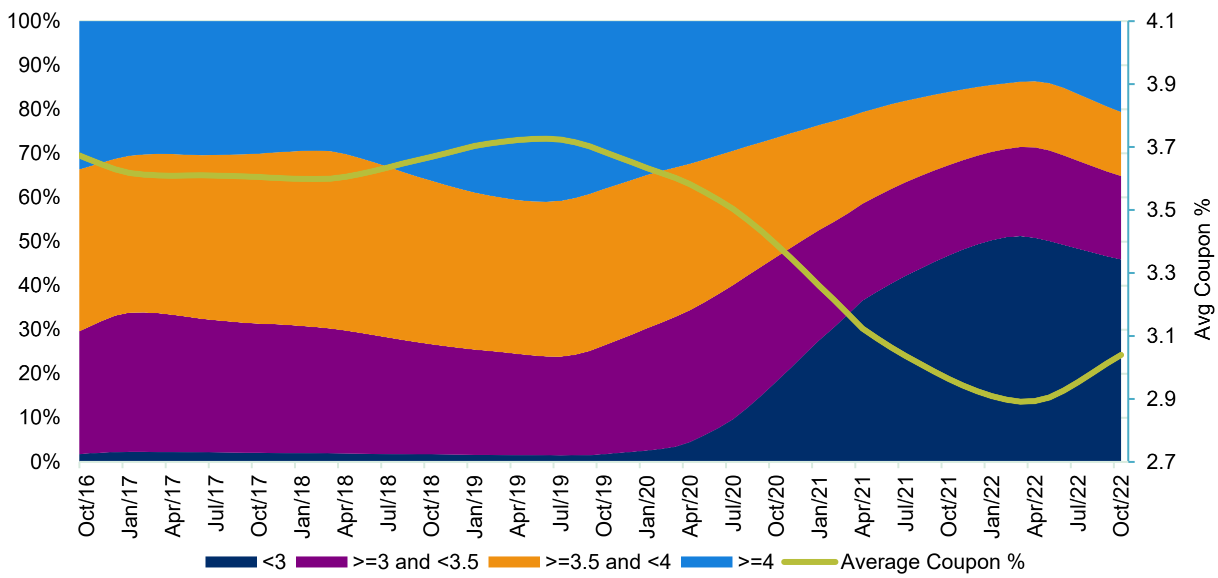
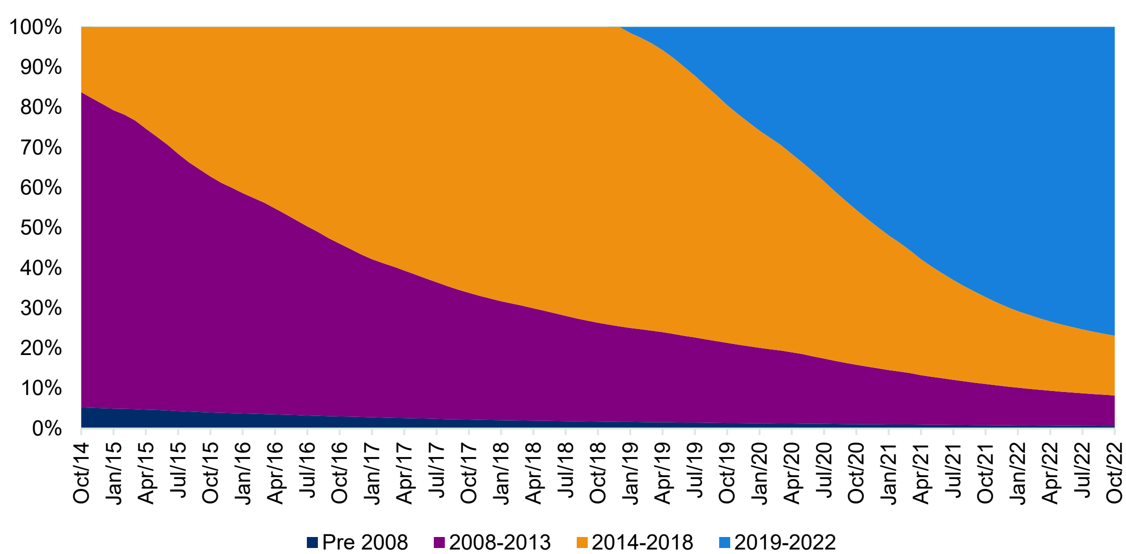


Figure 28. Outstanding Ginnie Mae MBS Balance, by Vintage.



Sources: Recursion. Note: October 2022 data points reflect the current composition of balances by coupon and vintage; factor data is not applied to prior date balance compositions. Average coupon is weighted by remaining principal balance.

7 AGENCY REMIC SECURITIES

7.1 Monthly REMIC Demand for Ginnie Mae MBS

In October 2022, $5.9 billion of Ginnie Mae MBS were securitized into Real Estate Mortgage Investment Conduits (REMICs) as underlying collateral, a 26% MoM decrease. Of that, approximately $869 million were Multifamily MBS having coupons between 3.51% and 4.0%. Approximately $4.8 billion were Single Family MBS with 80.0% of the Single-Family MBS having coupons over 4.0%.

As of month-end October 2022, approximately $94.6 billion of Ginnie Mae Single Family and Multifamily MBS were securitized into Ginnie Mae REMIC transactions. This represents a roughly 43% decrease over the same period in 2021 ($166.0 billion).

Figure 29. Ginnie Mae Single-Family and Multifamily MBS Securitized into REMICs.

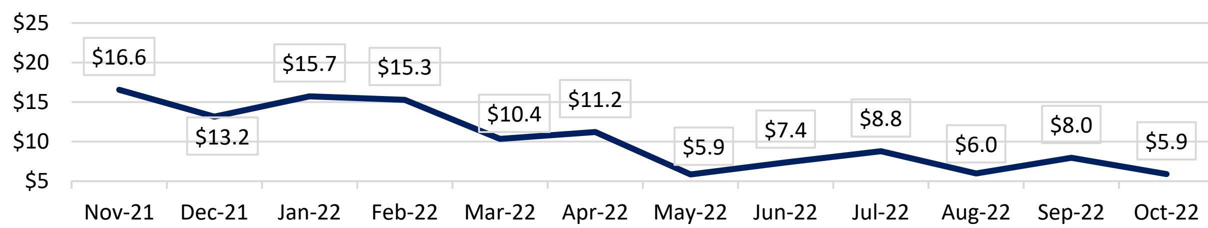


Table 7. October 2022 REMIC Collateral Coupon Distribution.

Net Coupon (%)	Approx. Ginnie Mae MBS amount securitized into REMIC Deals ($MM)[1]	% Breakdown of REMIC Collateral by coupon[17]
Multifamily		
3.51-4.00	869.5	100%
Subtotal	**869.5**	**100%**
Single-Family		
2.51-3.00	482.2	10.1%
3.01-3.50	348.0	7.3%
3.51-4.00	125.0	2.6%
4.01-4.50	301.6	6.3%
4.51-5.00	1,450.6	30.3%
5.01-5.50	1,699.2	35.5%
5.51-6.00	290.2	6.1%
6.01-6.50	84.3	1.8%
Subtotal	**4,781.2**	**100%**
Grand Total	**5,650.7**	

Source: Ginnie Mae Disclosure Files

[1] *Totals may not sum due to rounding.*

7.2 REMIC Market Snapshot

In October 2022, Ginnie Mae Single-Family REMIC collateral WAC decreased MoM by 15 bps for the first time since November 2021. Freddie Mac and Fannie Mae Single-Family REMIC collateral WAC continued to decrease MoM by 39 bps and 6 bps, respectively.

- In October 2022, Fannie Mae did not guarantee a Multifamily REMIC transaction.
- In October 2022, Ginnie Mae REMIC issuance volume was $6.6 billion, the sixth consecutive month of REMIC issuance volume below $10.0 billion.
- Ginnie Mae guaranteed three HREMIC transactions in October 2022. This is the fifth month in 2022 in which Ginnie Mae has guaranteed three HREMIC transactions. In 2021, there were no months where Ginnie Mae guaranteed three or more HREMIC transactions in a single month.

Figure 30. REMIC Issuance by Agency

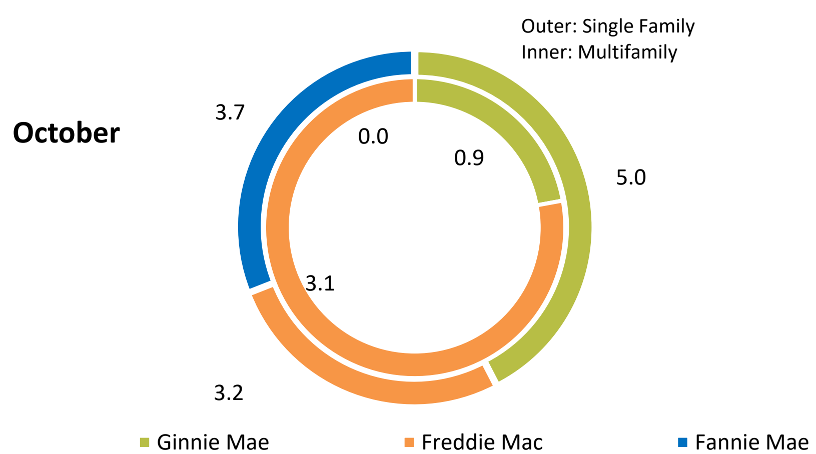


Table 8. Monthly REMIC Issuance by Agency

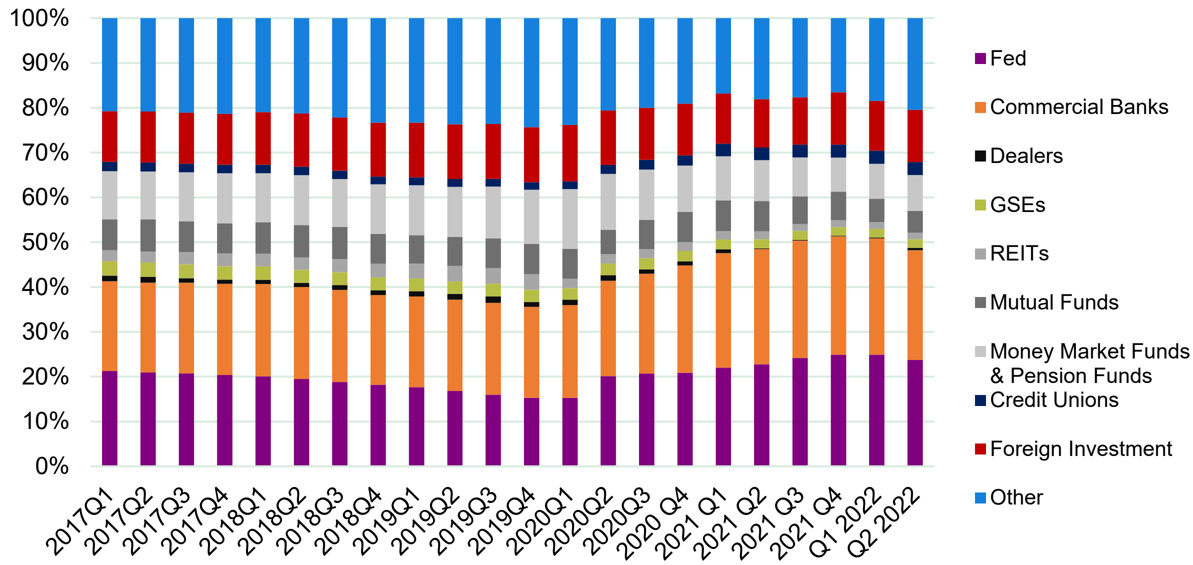
	SF REMIC Issuance Volume ($B)	% of SF REMIC Issuance Volume	Number of SF REMIC Trans-actions	MF REMIC Issuance Volume ($B)	% of MF REMIC Issuance Volume	Number of MF REMIC Trans-actions
Ginnie Mae	5.0	42.4	11	0.9	22.1	5
Freddie Mac	3.2	26.6	9	3.1	77.9	4
Fannie Mae	3.7	31.0	7	0.0	0.0	0
Total	$11.8	100%	27	$3.9	100%	9

Source: Ginnie Mae, Fannie Mae, and Freddie Mac Disclosure Files

8 MBS OWNERSHIP

As of Q2 2022, the largest holders of agency debt (agency MBS +agency notes and bonds) included commercial banks (24%), the Federal Reserve (24%), and foreign investors (12%). The Federal Reserve's share decreased slightly to 24% in the second quarter of 2022 from 25% in the first quarter. Along with Federal Reserves, commercial banks are also the largest holders of agency MBS. Out of their nearly $2.9 trillion in holdings as of the end of June 2022, $2.1 trillion was held by the top 25 domestic banks.

Figure 31. Who Owns Total Agency Debt?



Source: Federal Reserve Flow of Funds. Note: The "other" category includes primarily life insurance companies, state and local governments, households and nonprofits. Data as of Q2 2022.

8.1 Commercial Bank Holdings of Agency MBS

Table 8. Commercial Bank Holdings of Agency MBS

	Commercial Bank Holdings ($Billions)								Week Ending			
	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	5-Oct	12-Oct	19-Oct	26-Oct
Largest 25 Domestic Banks	2,200.4	2,186.8	2,163.9	2,143.9	2,122.4	2,117.0	2,115.5	2,096.8	2,073.6	2,071.4	2,060.7	2,054.6
Small Domestic Banks	748.6	744.1	736.1	730.8	735.8	731.8	738.3	712.4	693.6	693.3	691.2	693.7
Foreign Related Banks	39.3	36.6	34.2	36.5	36.5	38.0	35.1	37.4	37.3	35.8	35.2	35.8
Total, Seasonally Adjusted	**2,988.3**	**2,967.5**	**2,934.2**	**2,911.2**	**2,894.7**	**2,886.8**	**2,888.9**	**2,846.6**	**2,804.5**	**2,800.5**	**2,787.1**	**2,784.1**

Source: Federal Reserve Bank. Note: Small domestic banks include all domestically chartered commercial banks not included in the top 25. Data as of October 2022.

8.2 Bank and Thrift Residential MBS Holdings

In Q2 2022, MBS holdings at banks and thrifts continued to decrease. Like Q1 2022, the decrease was driven by GSE pass-throughs, Private MBS, and agency CMO holdings, with GSE pass-throughs seeing the largest decrease. In contrast, Ginnie Mae pass-throughs saw an increase of 0.2%. Total bank and thrift MBS holdings decreased by approximately 5.7% from Q2 2021 and 6.3% from Q1 2022. Out of the $2.6 trillion in MBS holdings at banks and thrifts as of Q2 2022, $2 trillion were GSE pass-throughs and $369 billion were Ginnie Mae pass-throughs.

Table 9. Bank and Thrift Residential MBS Holdings

	All Banks & Thrifts ($ in billions)						All MBS ($ in billions)	
Year	Total	GSE PT	GNMA PT	Private MBS	Agency CMO	Private CMO	Banks	Thrifts
2001	730.84	380.12	109.53	37.62	236.91	76.18	606.91	203.37
2002	832.50	477.57	101.46	20.08	244.98	89.88	702.44	209.66
2003	899.89	536.83	75.11	19.40	236.81	106.86	775.66	206.45
2004	1,011.01	621.73	49.33	20.55	208.18	160.55	879.75	234.31
2005	1,033.77	602.73	35.92	29.09	190.70	211.25	897.06	242.69
2006	1,124.46	659.65	31.13	42.32	179.21	243.28	983.49	223.42
2007	1,149.10	591.34	31.58	26.26	174.27	357.24	971.42	264.59
2008	1,218.77	739.14	100.36	12.93	207.66	259.04	1,088.00	211.73
2009	1,275.52	784.18	155.00	7.53	271.17	212.64	1,161.67	184.07
2010	1,433.38	763.93	163.13	7.34	397.30	181.61	1,233.28	200.09
2011	1,566.88	842.17	214.81	3.28	478.82	167.70	1,359.24	207.64
2012	1,578.86	950.41	242.54	17.16	469.27	138.67	1,430.63	148.22
2013	1,506.60	937.91	231.93	26.11	432.60	114.15	1,363.65	142.94
2014	1,539.32	964.16	230.45	20.33	449.90	104.94	1,409.84	129.48
2015	1,643.56	1,115.40	292.30	11.14	445.39	71.63	1,512.67	130.89
2016	1,736.93	1,254.13	323.46	7.40	419.80	55.60	1,576.07	160.86
1Q17	1,762.38	1,280.63	329.91	7.03	419.34	55.39	1,589.93	172.45
2Q17	1,798.66	1,320.59	335.47	6.38	417.89	53.79	1,635.11	163.55
3Q17	1,838.93	1,364.75	351.86	5.65	418.08	50.45	1,661.84	177.09
4Q17	1,844.15	1,378.53	367.70	4.63	413.97	47.01	1,672.93	171.22
1Q18	1,809.98	1,352.28	360.71	3.92	412.41	41.37	1,635.52	174.46
2Q18	1,806.58	1,345.80	368.88	7.45	414.41	38.92	1,631.65	174.93
3Q18	1,794.39	1,339.73	373.21	2.42	416.20	36.04	1,618.29	176.10
2018	1,814.97	1,361.00	380.43	2.69	416.59	34.69	1,634.99	179.98
1Q19	1,844.99	1,385.10	383.49	3.06	422.18	34.65	1,673.40	171.59
2Q19	1,907.13	1,445.91	407.97	2.90	421.56	36.76	1,727.65	179.47
3Q19	1,975.78	1,506.92	427.10	4.74	428.69	35.44	1,786.74	189.04
2019	1,985.38	1,516.26	426.85	4.62	428.99	35.52	1,796.29	189.09
1Q20	2,107.66	1,621.70	448.34	4.65	443.73	37.57	1,907.02	200.64
2Q20	2,195.19	1,669.93	441.06	5.00	478.11	42.14	1,946.36	248.83
3Q20	2,310.42	1,764.72	415.24	4.43	499.50	41.78	2,040.61	269.81
4Q20	2,520.90	1,928.21	390.66	3.94	548.65	40.10	2,210.22	310.68
1Q21	2,690.92	2,088.41	374.63	4.88	555.35	42.28	2,350.94	339.98
2Q21	2,781.91	2,178.57	352.77	4.77	555.45	43.12	2,431.76	350.15
3Q21	2,858.59	2,239.90	353.12	4.24	565.51	48.95	2,487.32	371.27
4Q21	2,906.04	2,268.19	352.71	4.45	577.98	55.42	2,529.78	376.26
1Q22	2,799.21	2,186.14	368.43	4.04	548.60	60.43	2,476.11	323.10
2Q22	2,623.79	2,035.14	369.20	3.81	523.01	61.83	2,321.17	302.62
Change:								
1Q22-2Q22	-6.3%	-6.9%	-8.4%	0.2%	-5.6%	-4.7%	-6.3%	-6.3%
2Q21-2Q22	-5.7%	-6.6%	-8.8%	4.7%	-20.0%	-5.8%	-4.5%	-13.6%

Source: Inside Mortgage Finance. Notes: Data as of Q2 2022

Table 10. Top 20 Bank and Thrift Residential MBS Investors ($ in millions)

	Institution	Total	GSE PT	GNMA PT	Agency CMO	Non-Agency	Share
1	BANK OF AMERICA CORPORATION	$495,136.0	$415,280.0	$71,947.0	$7,758.0	$151.0	18.9%
2	WELLS FARGO & COMPANY	$249,055.0	$177,562.0	$68,239.0	$3,125.0	$129.0	9.5%
3	CHARLES SCHWAB	$193,778.0	$109,214.0	$7,006.0	$77,558.0	$0.0	7.4%
4	JPMORGAN CHASE & CO.	$166,937.0	$83,341.0	$67,650.0	$98.0	$15,848.0	6.4%
5	Truist Bank	$119,517.0	$58,899.0	$13,721.0	$43,472.0	$3,425.0	4.6%
6	U.S. BANCORP	$111,998.70	$74,187.8	$23,448.4	$14,362.4	$0.1	4.3%
7	CITIGROUP INC.	$88,468.0	$80,696.0	$4,199.0	$2,754.0	$819.0	3.4%
8	Silicon Valley Bank	$72,216.0	$52,841.0	$8,614.0	$10,761.0	$0.0	2.8%
9	PNC Bank, National Association	$69,410.6	$56,515.3	$4,870.6	$6,817.9	$1,206.7	2.6%
10	CAPITAL ONE FINANCIAL CORPORATION	$65,099.6	$32,784.9	$14,056.7	$17,864.0	$394.0	2.5%
11	MORGAN STANLEY	$52,526.0	$37,767.0	$8,449.0	$6,310.0	$0.0	2.0%
12	BANK OF NEW YORK MELLON CORP	$44,587.0	$33,805.0	$1,452.0	$6,984.0	$2,346.0	1.7%
13	USAA Federal Savings Bank	$44,229.0	$37,351.0	$2,244.0	$4,634.0	$0.0	1.7%
14	State Street Bank and Trust Company	$37,413.3	$16,068.0	$3,830.0	$15,526.3	$1,989.0	1.4%
15	The Huntington National Bank	$30,194.1	$12,956.1	$9,571.6	$7,514.8	$151.6	1.2%
16	KeyBank National Association	$27,174.5	$4,278.4	$237.6	$22,658.5	$0.0	1.0%
17	TD Bank USA/TD Bank NA	$24,125.3	$1,005.3	$89.5	$22,989.6	$41.0	0.9%
18	Citizens Bank, National Association	$23,774.7	$13,187.7	$5,149.5	$5,437.5	$0.0	0.9%
19	Ally Bank	$22,166.0	$14,142.0	$1,756.0	$1,874.0	$4,394.0	0.8%
20	HSBC Bank USA, National Association	$21,949.7	$6,955.3	$8,307.3	$6,686.2	$1.0	0.8%
	Total Top 20	$1,959,755.5	$1,318,836.8	$324,838.2	$285,185.2	$30,895.4	74.8%

Source: Inside Mortgage Finance. Notes: Data as of Q2 2022.

8.3 Foreign Ownership of MBS

For the month of September 2022, foreign ownership of MBS represents $1.11 trillion in agency MBS, down approximately $59 billion from August 2022. Total foreign ownership includes $501 billion held by foreign private institutions and $610 billion held by foreign official institutions. The foreign share of the agency MBS Market continues to decline since the beginning of COVID. The pre-Covid peak of approximately 17.5% has fallen all the way to 13.08% in September of 2022.

Figure 32. Foreign Share of Agency MBS Market

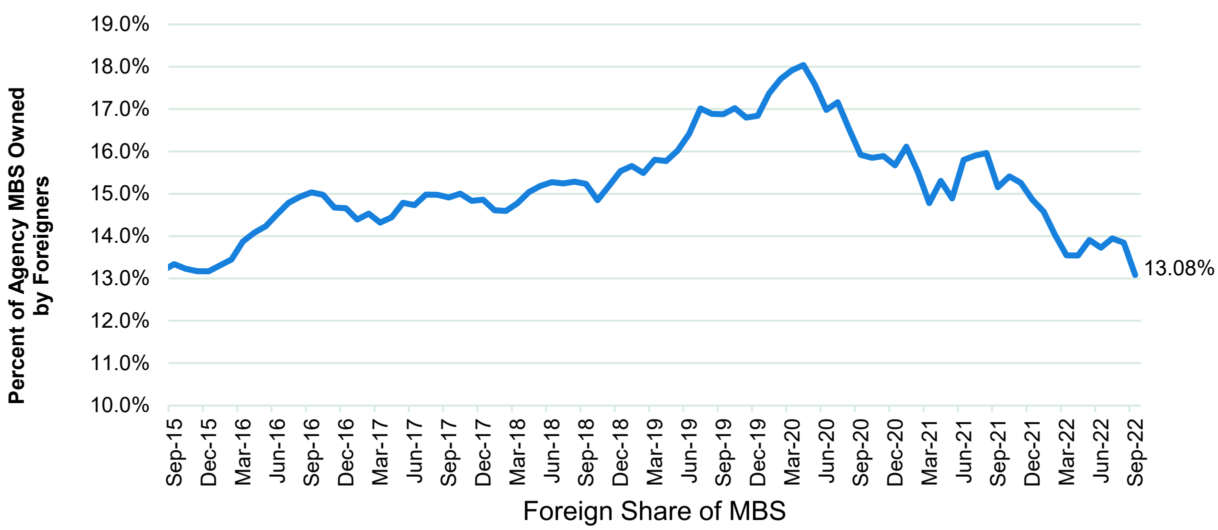
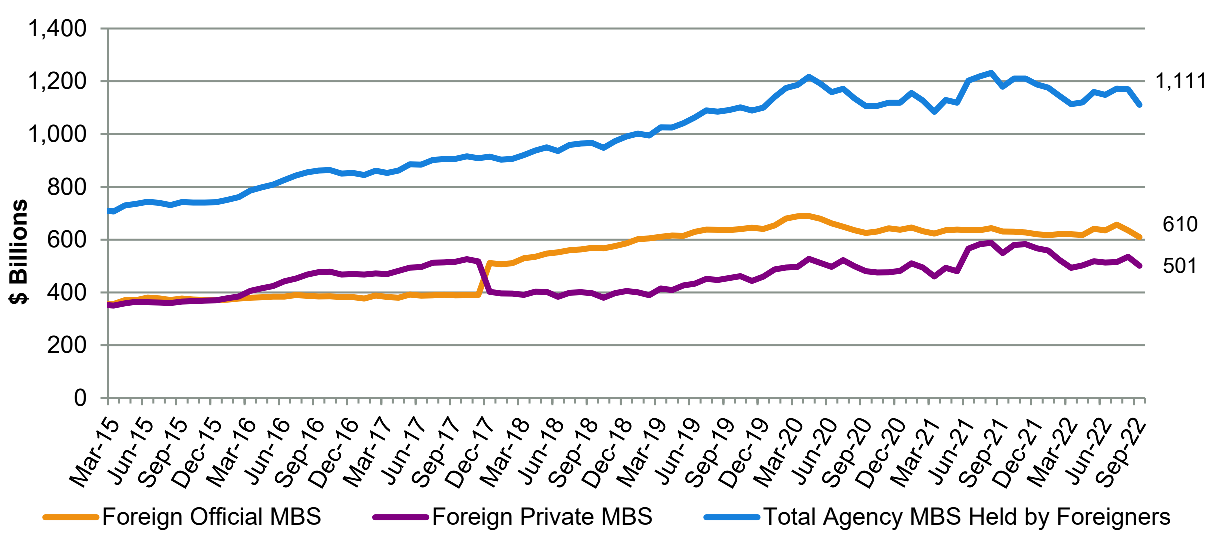


Figure 33. Monthly Foreign MBS Holdings



Sources: Recursion and Treasury International Capital (TIC) [Top Chart], Treasury International Capital (TIC) [Bottom Chart] Notes: 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. Data as of September 2022.

8.4 Foreign Ownership of Agency Debt and Agency MBS

The largest non-US holders of agency MBS are in Japan, China, and Taiwan. As of June 2022, these three own 60% of all US MBS held by investors outside of the United States. Between June 2021 and June 2022, Japan and Taiwan have decreased their agency MBS holdings while China has increased their holdings. Japan has decreased their holdings by $59.1 billion, Taiwan has decreased their holdings by $27.3 billion, and China has increased their holdings by $26.4 million.

Table 11. All Agency Debt

Country	*Level of Holdings ($ Millions)*				*Change in Holdings ($ Millions)*			
	9/1/2021	**12/1/2021**	**3/1/2022**	**6/1/2022**	**Q3 2021**	**Q4 2021**	**Q1 2022**	**Q2 2022**
Japan	310,272	301,979	259,844	252,455	-1,304	-8,293	-42,135	-7,389
China	215,056	202,659	219,553	244,266	-2,802	-12,397	16,894	24,713
Taiwan	246,887	244,375	233,340	222,670	-3,097	-2,512	-11,035	-10,670
Canada	75,674	77,979	73,475	75,998	-5,679	2,305	-4,504	2,523
United Kingdom	43,235	72,486	47,582	65,393	2,378	29,251	-24,904	17,811
Luxembourg	33,115	34,288	33,130	42,207	-4,641	1,173	-1,158	9,077
South Korea	43,021	42,051	40,362	37,934	-412	-970	-1,689	-2,428
Cayman Islands	35,603	35,004	31,795	33,984	-651	-599	-3,209	2,189
Ireland	21,960	21,305	20,589	19,838	121	-655	-716	-751
Switzerland	26,770	19,770	17,261	19,634	2,957	-7,000	-2,509	2,373
Other	183,394	190,886	185,541	192,354	-13,272	7,492	-5,345	6,813
Total	**1,234,987**	**1,242,782**	**1,162,472**	**1,206,733**	**-26,402**	**7,795**	**-80,310**	**44,261**

Table 12. Agency MBS

Country	*Level of Holdings ($ Millions)*		
	6/1/2021	*6/1/2022*	*YoY Change in Holdings ($ Millions)*
Japan	311,576	252,455	-59,121
China	217,858	244,266	26,408
Taiwan	249,984	222,670	-27,314
Canada	81,353	75,998	-5,355
United Kingdom	40,857	65,393	24,536
Luxembourg	37,756	42,207	4,451
South Korea	43,433	37,934	-5,499
Cayman Islands	36,254	33,984	-2,270
Ireland	21,839	19,838	-2,001
Switzerland	23,813	19,634	-4,179
Other	196,666	192,354	-4,312
Total	**1,261,389**	**1,206,733**	**-54,656**

Source: Treasury International Capital (TIC). Note: Level of agency debt Holdings by month data as of Q2 2022. Agency MBS as of June 2022. Revised to include top 10 holders of agency debt listed as of June 2022.

9 FIXED INCOME LIQUIDITY INDICATORS

The agency MBS average daily trading volume as of October 2022 was $246 billion for 2022 YTD, which is down from $281 billion for calendar year 2021. Compared to September 2022, agency MBS average daily trading volume saw a 1.2% increase MoM. In 2021, average agency MBS was at 2.70%, 25 bps lower than the 2020 average of 2.95%. In 2021, US Treasury turnover finished at 2.96%. Turnover for Corporates remains minimal relative to agency MBS or Treasury turnover.

Figure 34. Average Daily Trading Volume by Sector

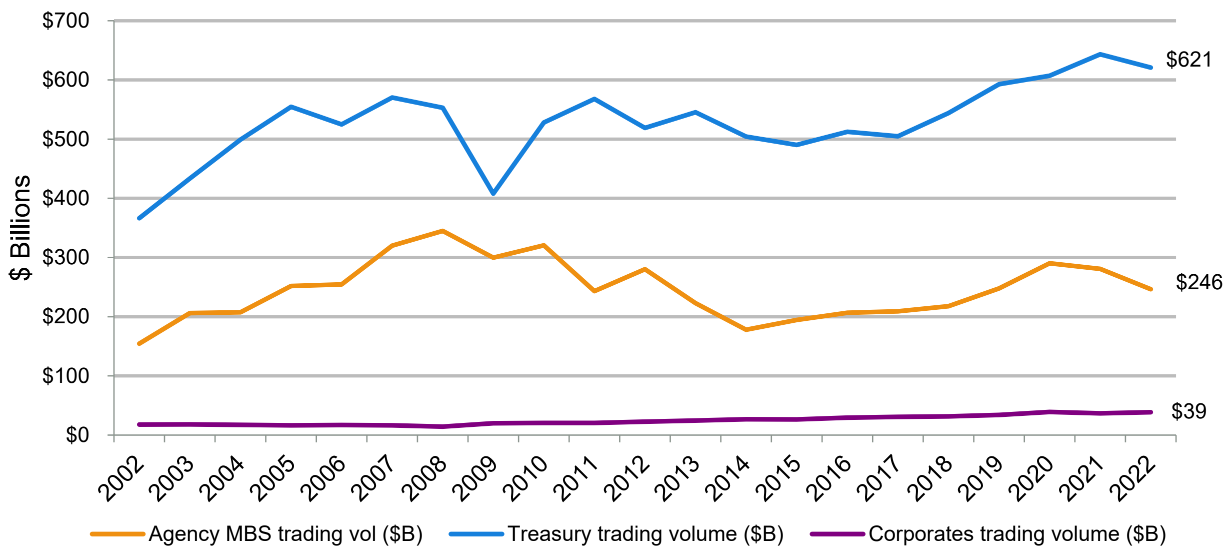
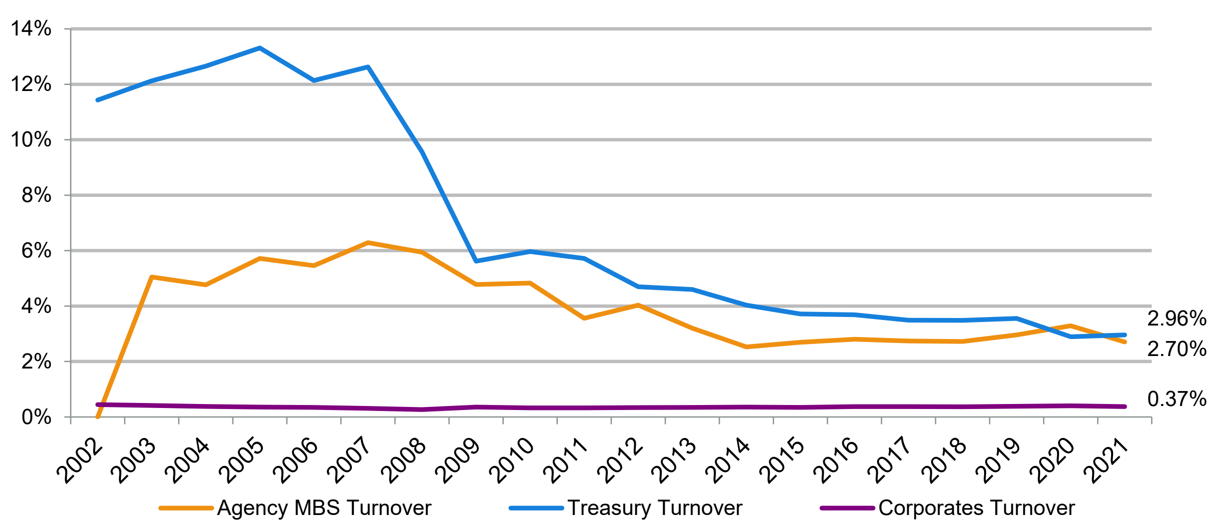


Figure 35. Average Daily Turnover by Sector



Source: SIFMA. Note: Data as of October 2022 for Average Daily Trading Volume by Sector and as of December 2021 for agency MBS in Average Daily Turnover by Sector.

PRIMARY MORTGAGE MARKET

10 AGENCY CREDIT BREAKDOWN

The tables below outline the population distributions of FICOs, DTIs, and LTVs between the agencies and between FHA, VA, and other Ginnie Mae loan sources as of the end of October 2022. The distribution statistics capture some key differences in the populations served by the agencies.

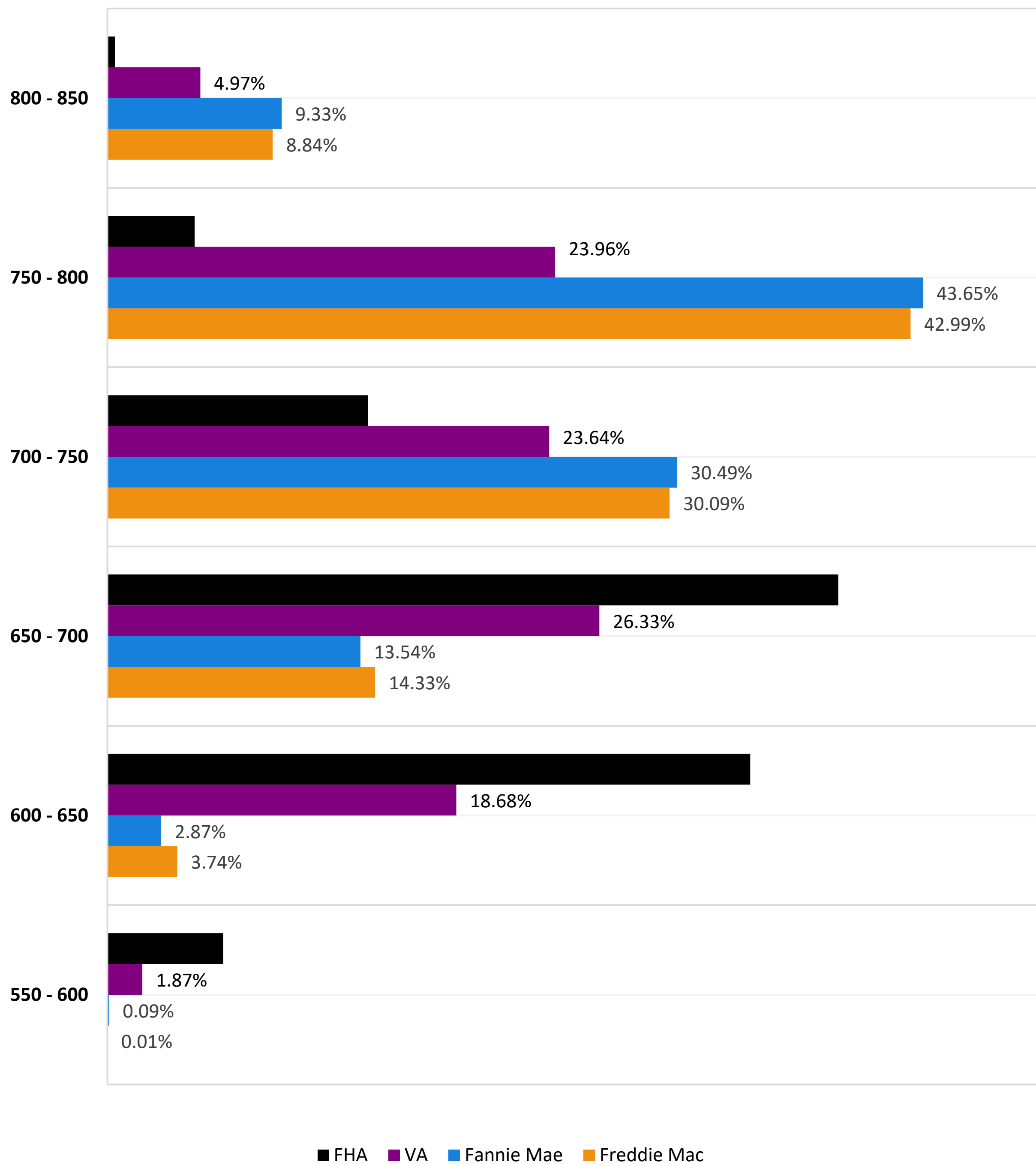
10.1 Credit Scores

Table 13. Share of Loans by FICO Score

Names	Number of Loans	P10	P25	Median	P75	P90	Mean
Purchase FICO							
All	230,020	647	687	739	777	797	729
Fannie	80,722	691	724	758	785	800	751
Freddie	65,739	695	727	760	786	801	753
Ginnie	83,559	625	647	680	728	774	689
Refi FICO							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	70,690	624	655	701	750	784	702
Fannie	24,789	664	698	738	773	796	733
Freddie	19,435	647	679	717	758	788	718
Ginnie	26,466	600	626	655	691	733	660
All FICO							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	300,710	641	678	730	773	795	723
Fannie	105,511	684	717	754	783	800	747
Freddie	85,174	680	714	753	783	799	745
Ginnie	110,025	619	642	674	719	768	682
Purchase FICO: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	83,559	625	647	680	728	774	689
FHA	49,193	620	641	666	697	735	671
VA	30,054	637	668	720	770	794	718
Other	4,312	635	660	694	732	763	697
Refi FICO: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	26,466	600	626	655	691	733	660
FHA	15,714	591	619	645	672	698	645
VA	10,719	615	642	679	721	760	682
Other	33	634	678	726	750	776	711
All FICO: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	110,025	619	642	674	719	768	682
FHA	64,907	611	634	661	692	728	665
VA	40,773	630	660	707	760	790	708
Other	4,345	635	660	694	732	763	697

Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files. Note: All averages are rounded to the nearest whole number.

Figure 36. FICO Distributions by Agency



Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

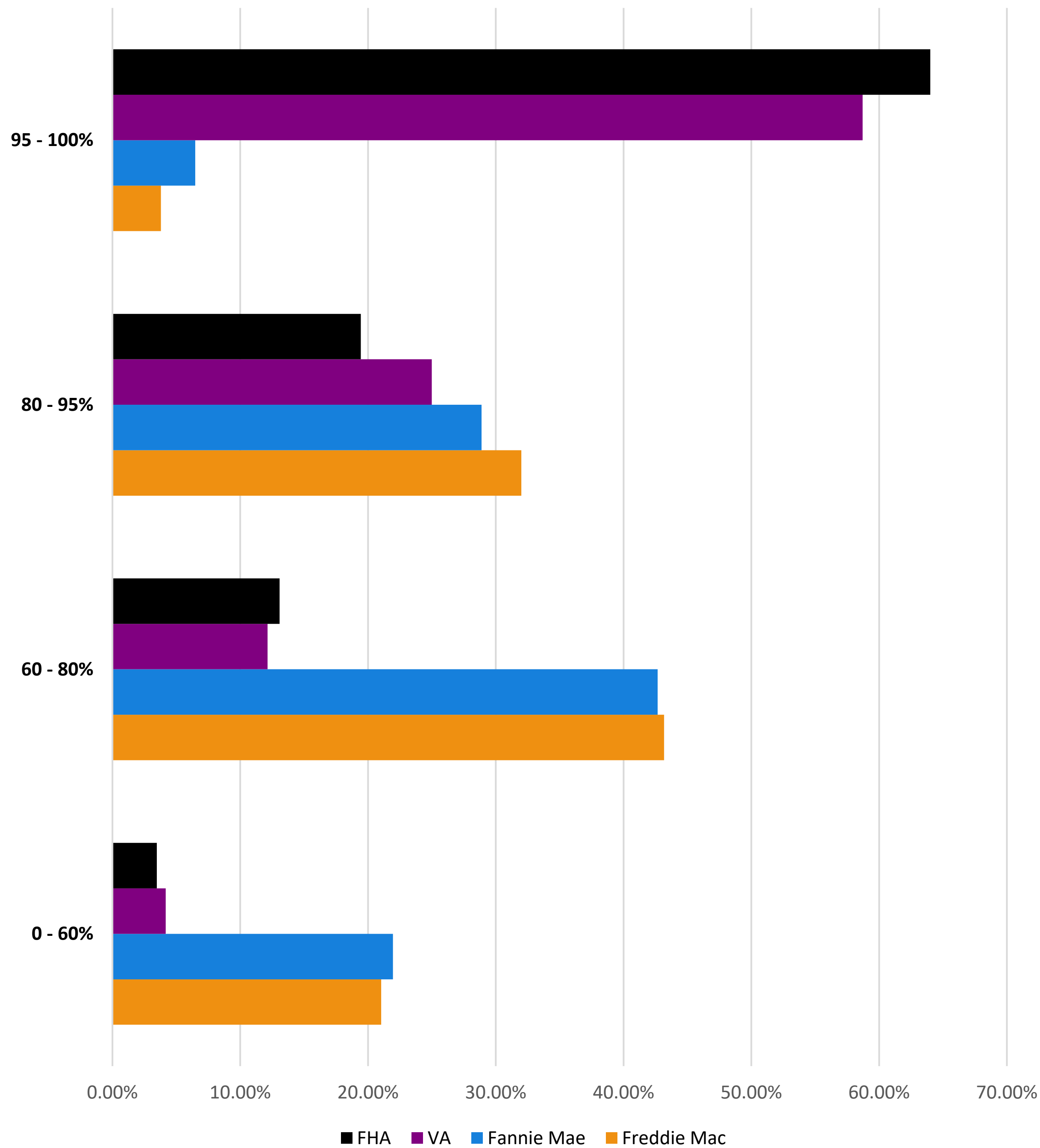
10.2 Loan-to-Value (LTV)

Table 14. Share of Loans by LTV

Purchase LTV							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	230,278	65	80	93	98	100	86
Fannie	80,821	57	75	80	95	95	80
Freddie	65,766	56	75	80	95	95	80
Ginnie	83,691	90	98	98	100	100	96
Refi LTV							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	70,727	39	55	70	80	84	66
Fannie	24,799	33	48	60	71	80	58
Freddie	19,435	36	50	63	75	80	60
Ginnie	26,493	59	70	80	83	90	77
All LTV							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	301,005	54	73	85	97	98	81
Fannie	105,620	47	65	80	90	95	75
Freddie	85,201	48	66	80	90	95	75
Ginnie	110,184	74	87	98	100	100	92
Purchase LTV: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	83,691	90	98	98	100	100	96
FHA	49,277	92	97	98	98	98	96
VA	30,086	86	100	100	100	102	97
Other	4,328	93	98	101	101	101	98
Refi LTV: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	26,493	59	70	80	83	90	77
FHA	15,727	57	68	78	81	81	73
VA	10,733	62	76	87	90	100	82
Other	33	59	80	91	97	100	86
All LTV: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	110,184	74	87	98	100	100	92
FHA	65,004	73	81	98	98	98	91
VA	40,819	75	90	100	100	102	93
Other	4,361	93	98	101	101	101	98

Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files. Note: All averages are rounded to the nearest whole number.

Figure 37. Loan-to Value by Agency



Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

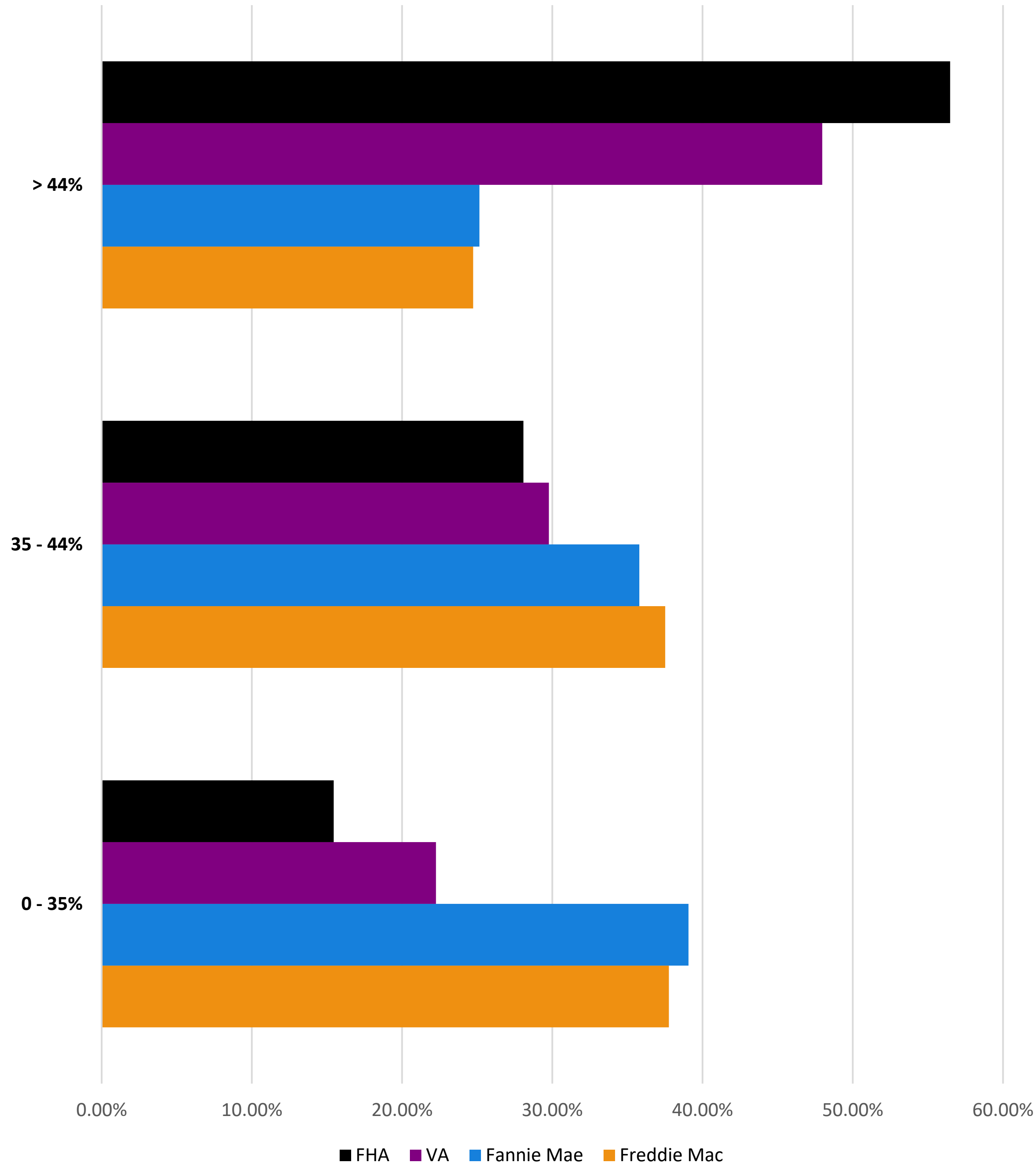
10.3 Debt-to-Income (DTI)

Table 15. Share of Loans by DTI

Purchase DTI							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	229,885	26	33	41	47	50	40
Fannie	80,821	24	31	39	45	48	37
Freddie	65,766	24	31	39	44	48	37
Ginnie	83,298	31	38	45	51	55	44
Refi DTI							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	70,591	25	33	40	45	50	39
Fannie	24,799	23	30	38	44	47	37
Freddie	19,435	25	32	40	44	48	38
Ginnie	26,357	28	36	43	50	54	42
All DTI							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	300,476	26	33	41	47	50	40
Fannie	105,620	24	31	39	45	48	37
Freddie	85,201	24	31	39	44	48	37
Ginnie	109,655	30	37	44	51	55	43
Purchase DTI: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	83,298	31	38	45	51	55	44
FHA	49,248	33	40	46	52	55	45
VA	29,734	30	37	44	50	56	43
Other	4,316	27	31	36	40	42	35
Refi DTI: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	26,357	28	36	43	50	54	42
FHA	15,702	29	37	44	50	55	43
VA	10,624	28	35	42	49	53	41
Other	31	29	33	36	39	40	35
All DTI: Ginnie Mae Breakdown By Source							
Names	**Number of Loans**	**P10**	**P25**	**Median**	**P75**	**P90**	**Mean**
All	109,655	30	37	44	51	55	43
FHA	64,950	32	39	46	51	55	44
VA	40,358	29	36	44	50	55	43
Other	4,347	27	31	36	40	42	35

Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files. Note: All averages are rounded to the nearest whole number.

Figure 38. Debt-to Income by Agency



Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

10.4 High LTV Loans: Ginnie Mae vs. GSEs

The share of high-LTV agency loans going to borrowers with FICO scores above 750 has decreased by approximately 4% between periods August 2020 – October 2020 and August 2022 - October 2022. The share of borrowers with DTIs below 35% decreased by approximately 23% over the same period. From the period between August 2020 – October 2020 to the period between August 2022 – October 2022, the share of high-LTV loans increased in the Ginnie Mae guarantee book by approximately 10% and in the GSE portfolios by approximately 118%. Still, Ginnie Mae maintains its key role of expanding credit access to low-to-moderate income borrowers as it continues to dominate high-LTV lending, with 67.81% of its issuances between August 2022 and October 2022 having LTVs of 95 or above, compared to 21.36% for the GSEs.

Table 16. Share of Loans with LTV > 95

	Ginnie Mae	*GSE*	*All*
Aug 2020 - Oct 2020	61.78%	9.81%	21.52%
Aug 2022 - Oct 2022	67.81%	21.36%	37.20%

Table 17. Agency Market Share by DTI and FICO for Loans with LTV > 95 (Aug 2020-Oct 2020)

	FICO					
DTI	<650	650-700	700-750	≥750	NA	All
<35	1.90%	4.62%	6.39%	11.00%	0.16%	24.08%
35-45	4.00%	9.25%	10.43%	11.24%	0.05%	34.96%
≥45	3.58%	7.88%	7.07%	5.89%	0.03%	24.45%
NA	1.63%	2.71%	2.64%	3.03%	6.49%	16.51%
All	**11.11%**	**24.46%**	**26.54%**	**31.16%**	**6.74%**	**100.00%**

Table 18. Agency Market Share by DTI and FICO for Loans with LTV > 95 (Aug 2022-Oct 2022)

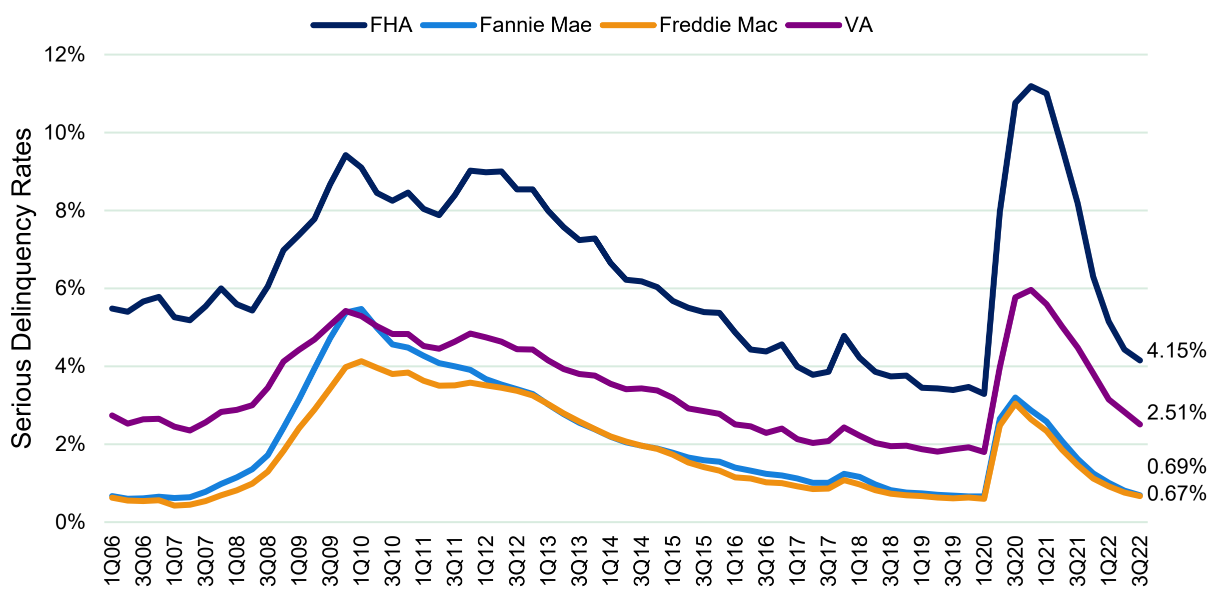
	FICO					
DTI	<650	650-700	700-750	≥750	NA	All
<35	2.17%	3.55%	4.95%	7.81%	0.03%	18.52%
35-45	5.83%	9.16%	10.62%	11.59%	0.03%	37.23%
≥45	7.93%	13.02%	11.69%	10.27%	0.06%	42.96%
NA	0.30%	0.24%	0.17%	0.16%	0.42%	1.29%
All	**16.25%**	**25.96%**	**27.43%**	**29.82%**	**0.54%**	**100.00%**

Sources: Recursion and Ginnie Mae. Data as of October 2022.

10.5 Serious Delinquency Rates

Serious delinquency rates for single-family GSE, FHA, and VA loans all continued to fall sharply in Q3 2022. From Q2 2022 to Q3 2022, Fannie and Freddie serious delinquencies decreased 12 and 9 bps, respectively, or 15% and 12% respectively, as a percentage change. Ginnie Mae collateral's serious delinquency rates decreased more than the GSE rates in absolute terms, with FHA and VA dropping 28 and 32 bps respectively. This decline in serious delinquency rates is consistent with the decrease in the number of loans in forbearance captured in Section 11 below.

Figure 39. Serious Delinquency Rates: Single-Family Loans.



Sources:

1. *Fannie Mae and Freddie Mac Monthly Summary Reports*
2. *MBA Delinquency Survey.*

Note: Serious delinquency is defined as 90 days or more past due or in the foreclosure process. Data as of Q3 2022.

10.6 Credit Box

The first-time homebuyer share for agency purchase loans was 53.0% in October 2022, up slightly from 51.1% in October 2021. Ginnie Mae and Freddie Mac's first-time homebuyer shares, 68.3% and 43.4% respectively in October, have remained relatively flat YoY. Fannie Mae's first-time homebuyer share has declined 3.2% YoY. Table 20 shows that based on mortgages originated in October 2022, the average GSE first-time homebuyer was more likely than an average repeat buyer to have a lower credit score, and higher LTVs. While Ginnie Mae's first-time homebuyers were more likely than their repeat buyers to have lower loan amounts and credit scores, other components of the credit profile were very similar.

Figure 40. First-Time Homebuyer Share: Purchase Only Loans

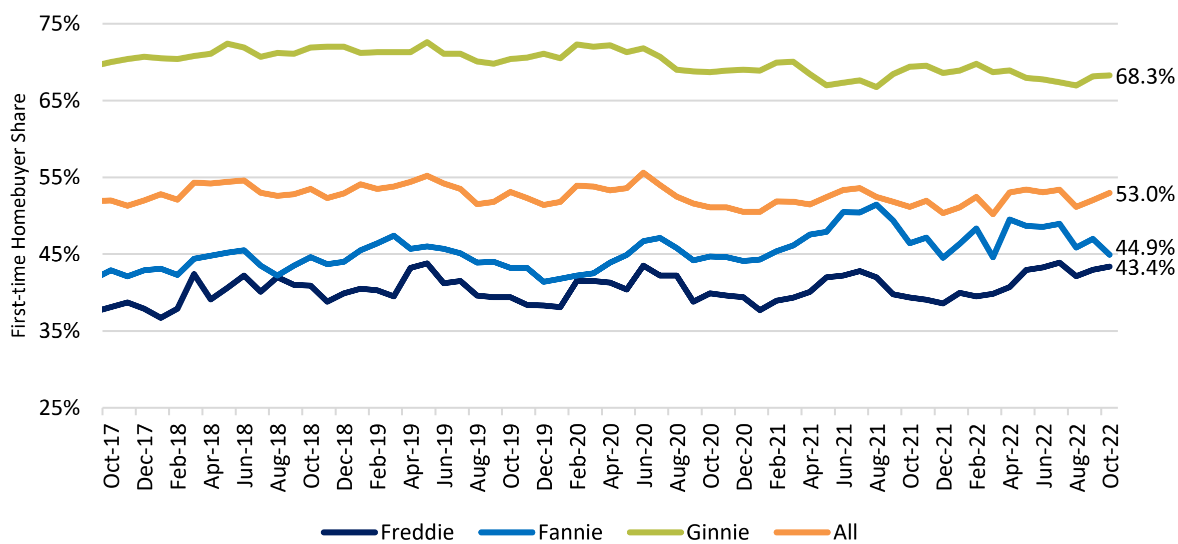


Table 19. Agency First-Time Homebuyer Share Summary

	Fannie Mae		Freddie Mac		Ginnie Mae		All	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount $	320,953	329,562	328,480	329,810	298,112	355,359	313,991	334,861
Credit Score	744.7	757.3	747.0	756.3	683.3	703.1	720.9	746.0
LTV (%)	86.3	75.3	85.6	76.2	97.4	94.4	90.5	79.5
DTI (%)	37.2	37.4	36.7	37.1	43.6	44.4	39.6	38.7
Loan Rate (%)	5.5	5.5	5.4	5.5	5.3	5.2	5.4	5.4

Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

Within the Ginnie Mae purchase market, 76.8% of FHA loans, 52.2% of VA loans, and 82.8% of other loans represent financing for first-time home buyers in October 2022. While FHA loans remained stable, VA and other increased MoM. Table 21 shows that based on mortgages originated in October 2022, the credit profile of the average VA first-time homebuyer was significantly different than the average VA repeat buyer. The average VA first-time homebuyer took out 15% smaller loans, had a 22-point lower credit score, 4.5% higher LTVs and were 10 bps higher in interest. FHA's first-time homebuyers are much more like their repeat buyers, with only 4.9% smaller loans and 2.4% higher LTVs. FHA's repeat buyers continue to have lower credit scores than their first-time home buyers. For VA and conventional borrowers alike, repeat buyers tend to have higher credit scores than first-time homebuyers. However, for FHA, lending is one of few credit options for borrowers with lower credit scores.

Figure 41. First-time Homebuyer Share: Ginnie Mae Breakdown

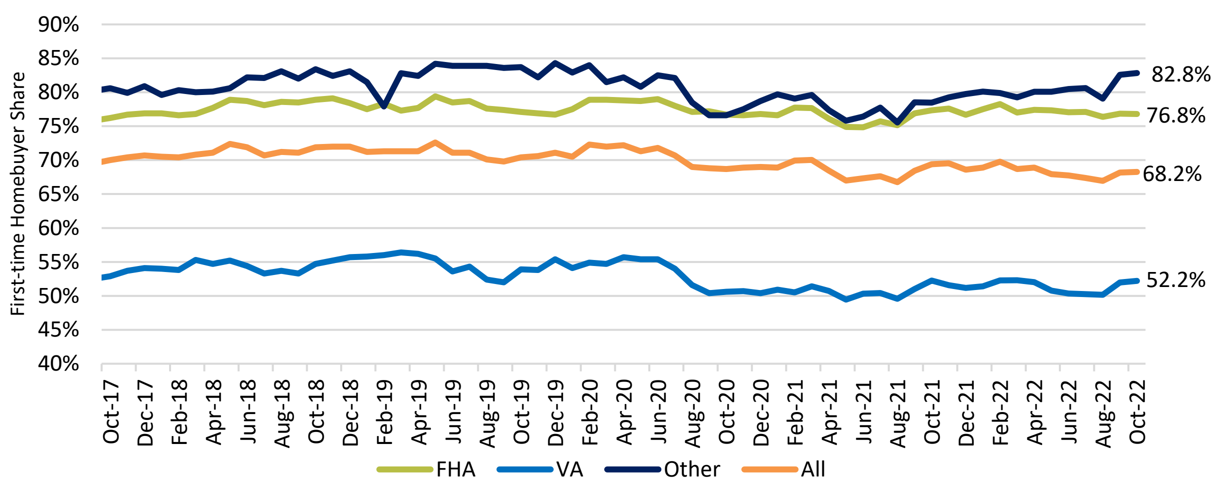


Table 21. Ginnie Mae First-Time Homebuyer Share Breakdown Summary

	FHA		VA		Other		Total	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount $	290,406	305,532	341,390	402,407	185,606	200,132	298,112	355,359
Credit Score	672.1	669.1	707.6	729.7	695.9	704.3	683.3	703.1
LTV (%)	96.7	94.3	98.8	94.3	98.4	98.5	97.4	94.4
DTI (%)	44.8	45.6	42.7	43.9	35.0	35.7	43.6	44.4
Loan Rate (%)	5.4	5.3	5.2	5.1	5.3	5.3	5.3	5.2

Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

10.7 Credit Box: Historical

For each of the agencies, the median borrower FICO scores have been slowly declining since the beginning of 2022. The median FICO score for all agency loans originated in October was 728, which represents an 11 point decrease since the start of 2022, a decline of 4 points MoM, and a decline of 18 points YoY. The trend in declining median FICO scores has been much more pronounced for refinance loans. Ginnie median FICO scores have declined from 689 in October 2021 to 655 in October 2022, a 34 point drop. As of October 2022, average FICOs for refinances have dropped for Fannie Mae and Freddie Mac borrowers YoY 27 and 36 points respectively.

Figure 42. FICO Scores for All Loans

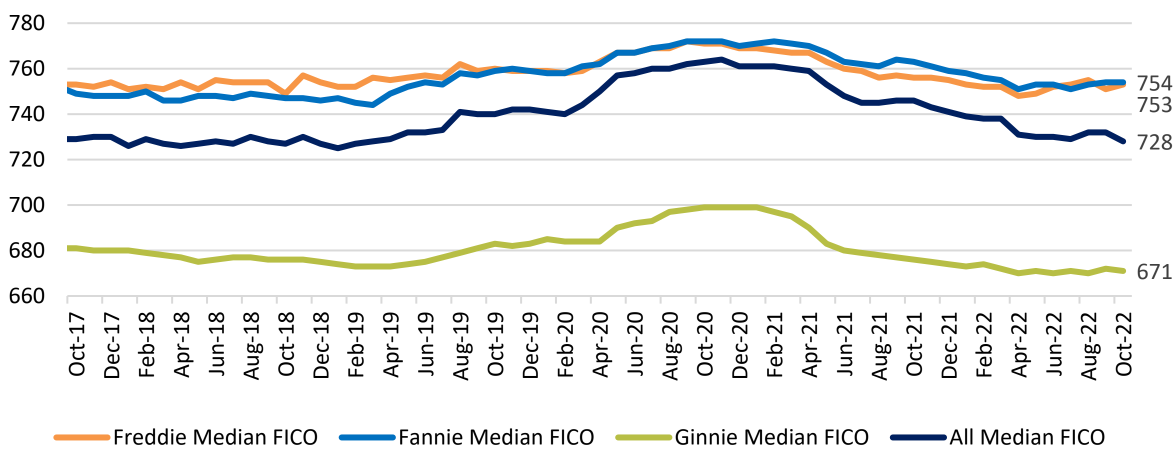


Figure 43. FICO Scores for Purchase Loans

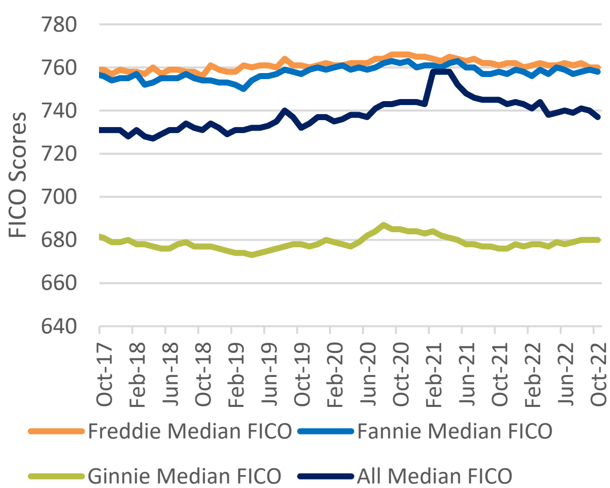
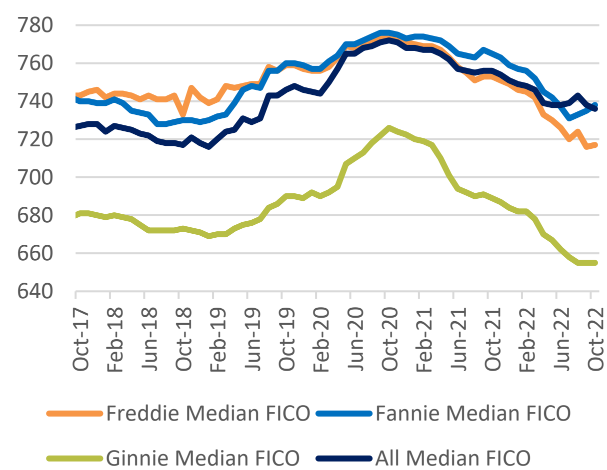


Figure 44. FICO Scores for Refinance Loans



Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

In October 2022, the median LTV for Ginnie Mae loans was 98.2% compared to 80% for the GSEs. Freddie Mac and Fannie Mae each saw increases in median LTV YoY, whereas Ginnie Mae LTVs remained relatively flat over that same period. Median LTV for Freddie Mac increased 12.6% YoY and increased 15.9% YoY for Fannie Mae. Since early 2022, DTIs have been increasing for Ginnie Mae, Freddie Mac, and Fannie Mae and are all higher relative to October 2021.

Figure 45. LTV Ratio for All Loans

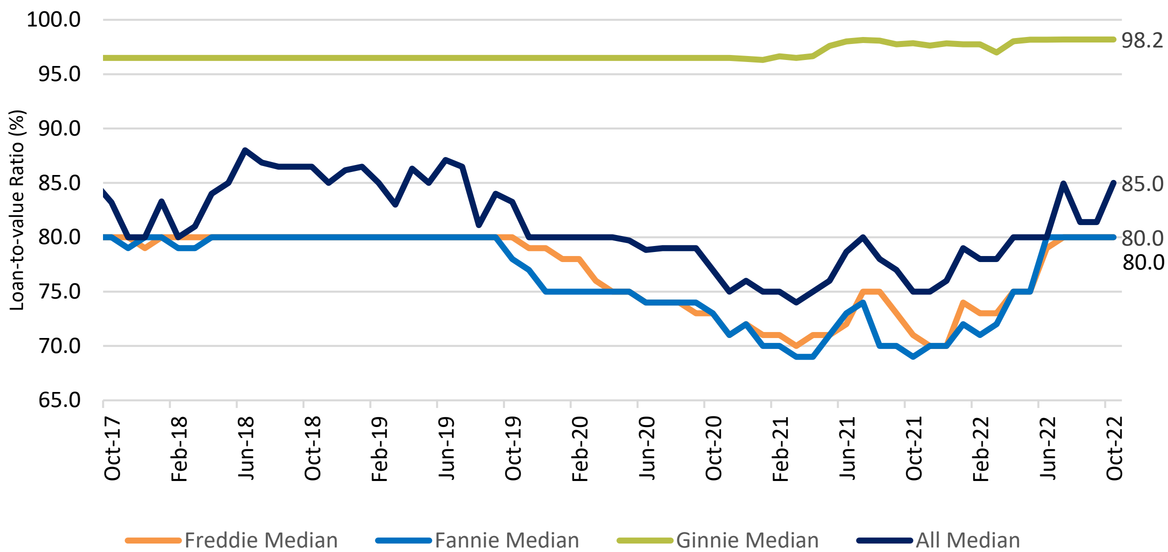
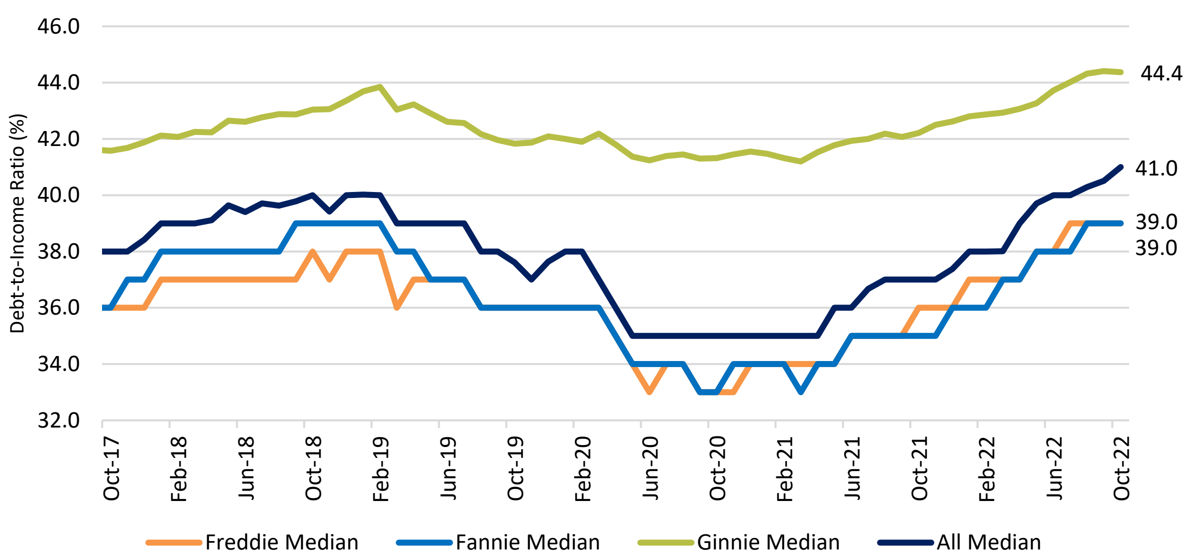


Figure 46. DTI Ratio for All Loans



Sources: Fannie Mae, Freddie Mac, and Ginnie Mae disclosure files.

11 FORBEARANCE TRENDS

As of the end of October 2022, 135,770 Ginnie Mae loans were in forbearance. The number of loans in forbearance removed from MBS pools was 2,836 while 135,028 loans in forbearance still actively remain in pools. The number of loans in forbearance for Ginnie Mae, FHA, and VA was higher for loans originated by nonbanks than banks in all subsets.

Table 22. Forbearance Snapshot

	FICO	Note	Current Principal	First Time	Purchase	Loan Count
All Loans in Forbearance – October 2022						
Ginnie	656	3.4	$196,106.34	75.3	74.1	135,770
Bank	671	3.7	$139,477.52	81.5	85.8	12,980
Nonbank	655	3.4	$201,876.70	74.8	73.2	122,765
FHA	652	3.5	$193,000.00	78.5	77.9	99,129
Bank	669	3.7	$144,233.12	85.4	87.8	10,544
Nonbank	651	3.5	$199,085.45	77.8	77.1	88,570
VA	666	3.2	$248,774.99	61.1	58.3	25,517
Bank	678	3.4	$189,063.48	58.4	73.3	1,646
Nonbank	666	3.1	$252,391.15	61.2	57.6	23,865
Loans in Forbearance and Removed from Pools – October 2022						
	FICO	**Note**	**Current Principal**	**First Time**	**Purchase**	**Loan Count**
Ginnie	667	3.5	$163,450.32	66.2	59.5	742
Bank	665	4.3	$91,619.56	60.6	63.8	200
Nonbank	667	3.3	$194,768.12	67.4	58.7	542
FHA	663	3.6	$155,060.86	70.4	60.5	462
Bank	661	4.4	$80,482.05	63.9	62.8	146
Nonbank	664	3.4	$192,424.95	72.3	60.0	316
VA	673	3.1	$200,858.34	56.2	52.4	214
Bank	683	3.9	$123,490.05	52.0	59.8	37
Nonbank	672	3.1	$230,516.51	56.6	51.6	177
Loans in Forbearance that Remain in Pools – October 2022						
	FICO	**Note**	**Current Principal**	**First Time**	**Purchase**	**Loan Count**
Ginnie	656	3.4	$196,264.56	75.4	74.2	135,028
Bank	671	3.7	$147,332.62	81.7	86.1	12,780
Nonbank	655	3.4	$201,902.83	74.9	73.3	122,223
FHA	652	3.5	$193,109.39	78.5	78.0	98,667
Bank	669	3.7	$144,966.36	85.6	88.1	10,398
Nonbank	651	3.5	$199,108.60	77.9	77.2	88,254
VA	666	3.2	$249,021.61	61.1	58.3	25,303
Bank	678	3.4	$191,780.90	58.5	73.5	1,609
Nonbank	666	3.1	$252,518.95	61.3	57.6	23,688

*Sources: Ginnie Mae loan level MBS disclosure and forbearance file and Ginnie Mae Issuer Operational Performance Profile (IOPP) -Peer Group Listings. Notes: Data as of October 2022; *Averages weighted by remaining principal balance of the loans.*

The current share of Ginnie Mae loans in forbearance stands at 1.26% as of the end of October 2022, approximately 1.0% higher than observed as of the end of September 2022. With the forbearance rate for Ginnie Mae collateral having been just 0.25% in March of 2020, prior to lockdown and the introduction of borrowers' right to forbearance under the CARES Act, the current rates remain approximately five times higher than the forbearance rate just prior to the pandemic. The rate of convergence to pre-pandemic rates has continued to slow down in October 2022.

Figure 47. Share of Ginnie Mae Loans in Forbearance.

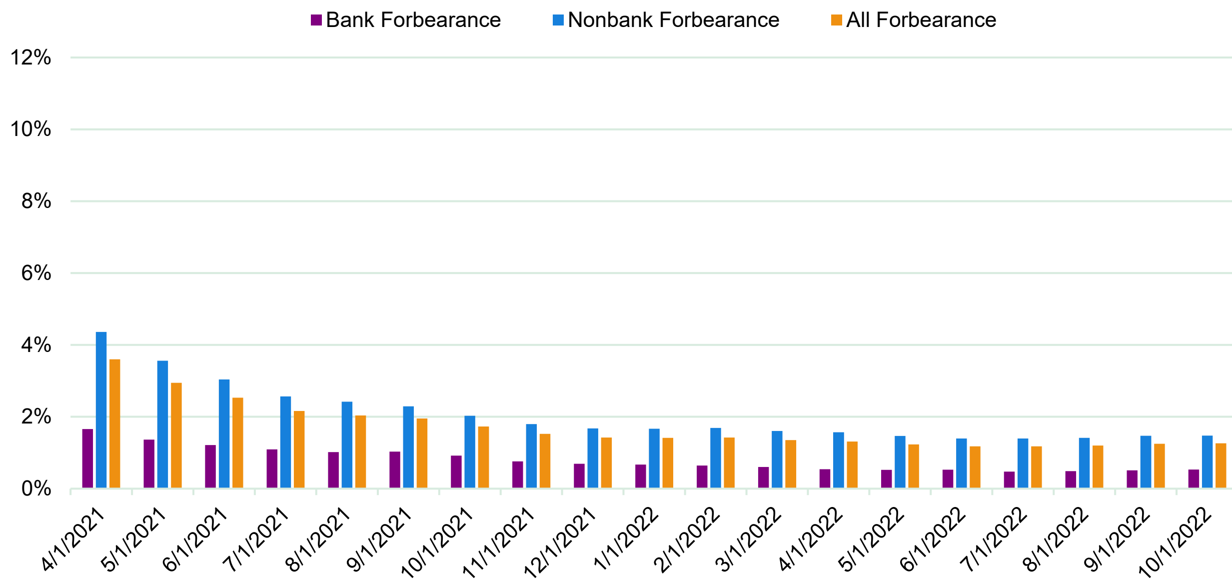


Figure 48. Number of Loans Removed from Pools: Non-bank

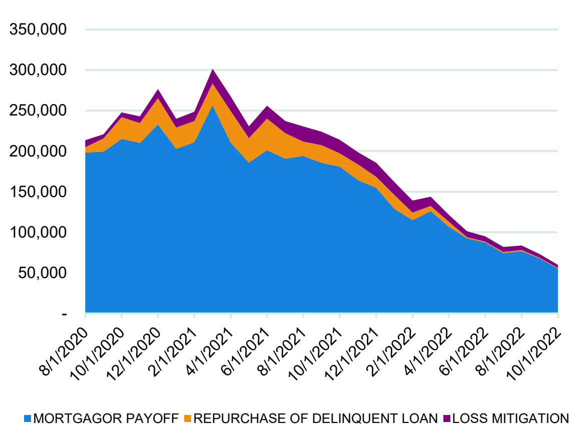
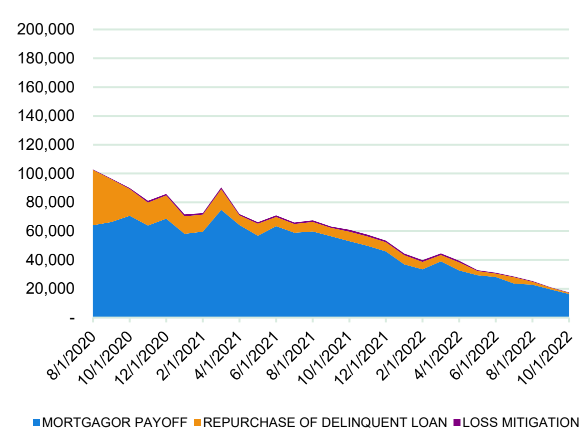


Figure 49. Number of Loans Removed from Pools: Bank



Source: Recursion. Note: Data as of October 2022. Beginning with the May 2022 GMAR Report, Credit Unions will be classified as Banks based on the updated Recursion data source.

Of the Ginnie Mae loans that were liquidated from pools due to mortgage delinquency (these counts include all delinquent buyouts, regardless of forbearance status), a higher share of the loans were FHA versus VA loans (top charts, orange areas). Liquidated loans across FHA and VA are now more likely to have coupons less than 3.5% (bottom charts: "Number of Loans Removed from Pools by Coupon"). In October 2022, the number of loans repurchased due to delinquency decreased 41% to 937 for FHA and decreased 10% to 311 for VA loans.

Figure 50. Number of Loans Removed from Pools: FHA

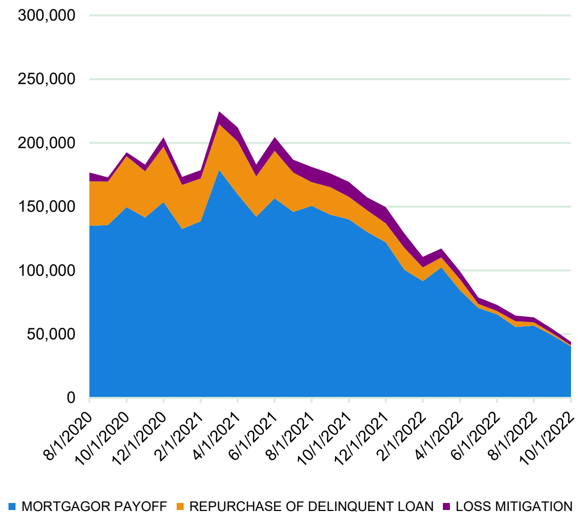


Figure 51. Number of Loans Removed from Pools: VA

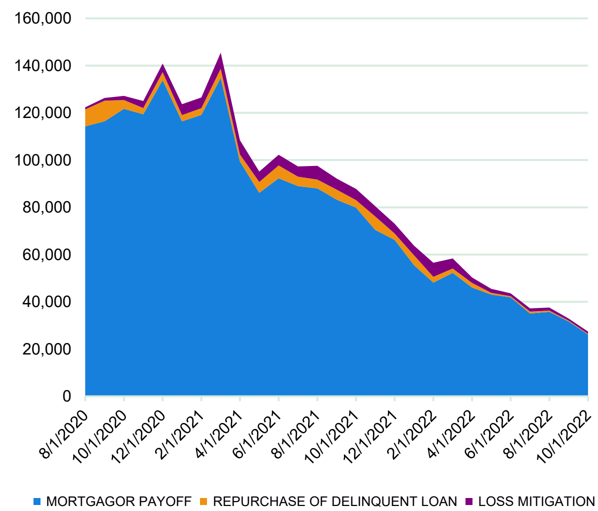
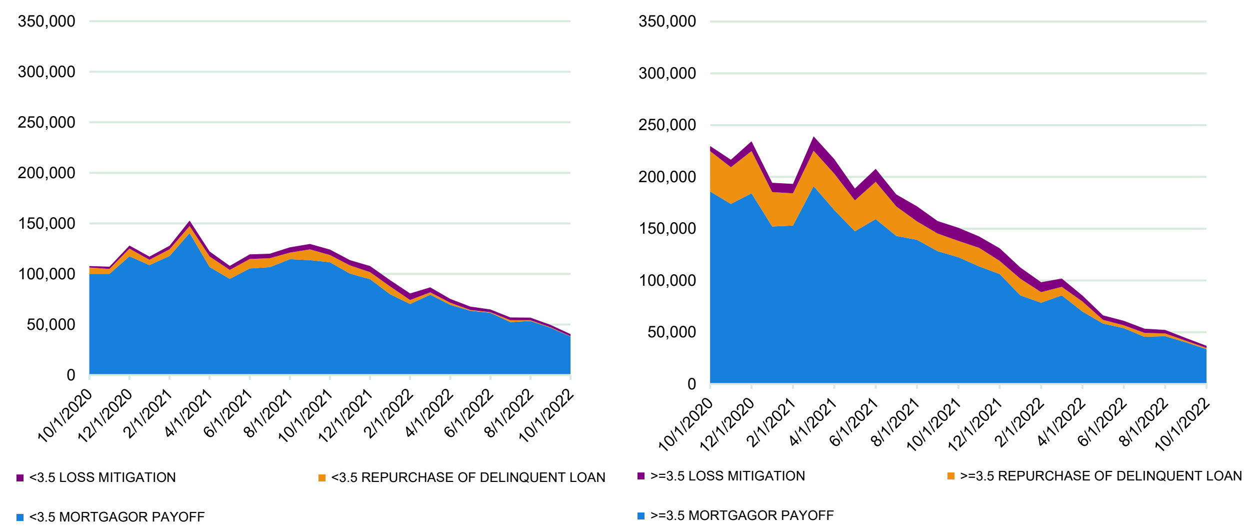


Figure 52. Number of Loans Removed from Pools by Coupon:



Source: Recursion. Note: Data as of October 2022.

12 HOLDERS OF GINNIE MAE MORTGAGE SERVICING RIGHTS

This table shows the 30 largest owners of mortgage servicing rights (MSR) by UPB for loans collateralizing Ginnie Mae MBS. The top 30 firms collectively own 84.00% of Ginnie Mae MSRs (see Cumulative Share). Twenty-three of these top 30 are non-depository institutions, the remaining 7 are depository institutions. As of October 2022, over half (51.02%) of the Ginnie Mae MSRs are owned by the top six firms.

Table 23. Top 30 Holders of Ginnie Mae Mortgage Servicing Rights (MSRs), by UPB

Rank	MSR Holder	UPB ($ millions)	Share	Cumulative Share
1	DBA FREEDOM HOME MOR	$251,551,717,948	12.1%	12.06%
2	LAKEVIEW LOAN SERVIC	$244,397,094,892	11.6%	23.69%
3	PENNYMAC LOAN SERVIC	$241,593,694,598	11.5%	35.17%
4	NATIONSTAR MORTGAGE,	$116,157,766,470	5.5%	40.69%
5	WELLS FARGO BANK, NA	$113,563,048,114	5.4%	46.09%
6	ROCKET MORTGAGE, LLC	$103,654,953,059	4.9%	51.02%
7	CARRINGTON MORTGAGE	$80,432,889,790	3.8%	54.84%
8	NEWREZ LLC	$66,681,213,131	3.2%	58.01%
9	CALIBER HOME LOANS,	$53,005,112,271	2.5%	60.53%
10	UNITED WHOLESALE MOR	$52,628,953,850	2.5%	63.03%
11	U. S. BANK, NA	$50,115,393,850	2.4%	65.41%
12	PLANET HOME LENDING,	$39,789,049,021	1.9%	67.30%
13	MORTGAGE RESEARCH CE	$37,109,225,204	1.8%	69.07%
14	LOANDEPOT.COM,LLC	$35,656,310,614	1.7%	70.76%
15	NAVY FEDERAL CREDIT	$29,073,919,570	1.4%	72.14%
16	AMERIHOME MORTGAGE C	$28,598,844,634	1.4%	73.50%
17	GUILD MORTGAGE COMPA	$21,932,011,966	1.0%	74.54%
18	THE MONEY SOURCE INC	$20,941,436,223	1.0%	75.54%
19	TRUIST BANK	$20,306,998,176	1.0%	76.50%
20	CROSSCOUNTRY MORTGAG	$17,899,269,053	0.9%	77.35%
21	NEW AMERICAN FUNDING	$17,112,167,820	0.8%	78.17%
22	VILLAGE CAPITAL & IN	$15,614,369,595	0.7%	78.91%
23	MOVEMENT MORTGAGE,LL	$15,388,970,153	0.7%	79.64%
24	CMG MORTGAGE, INC.	$14,815,797,201	0.7%	80.35%
25	IDAHO HOUSING AND FI	$14,023,027,757	0.7%	81.01%
26	RUSHMORE LOAN MANAGE	$13,989,108,413	0.7%	81.68%
27	CITIZENS BANK N.A.	$13,832,500,693	0.7%	82.33%
28	PHH MORTGAGE CORPORA	$11,917,252,813	0.6%	82.90%
29	MIDFIRST BANK	$11,775,220,997	0.6%	83.46%
30	CARDINAL FINANCIAL C	$11,419,650,713	0.5%	84.00%

Source: Deloitte. Data as of November 2022.

13 AGENCY NONBANK ORIGINATORS

Total agency non-bank origination experienced a slight increase in October, up approximately 0.4% since last month. This increase in non-bank origination share was driven primarily by Ginnie Mae (non-bank origination share up 1.7% MoM). The Ginnie Mae non-bank share rose to 89.9% as of October 2022 and has remained consistently higher than the GSEs since September 2021 (89.1%). Ginnie Mae non-bank origination share of refinance mortgage loans has continued to drive Ginnie Mae's relatively higher non-bank origination share. GSE origination volume of purchase mortgage loans has been the primary driver in the MoM decline of agency non-bank origination share.

Figure 53. Agency Nonbank Originator Share (All, Purchase, Refi)

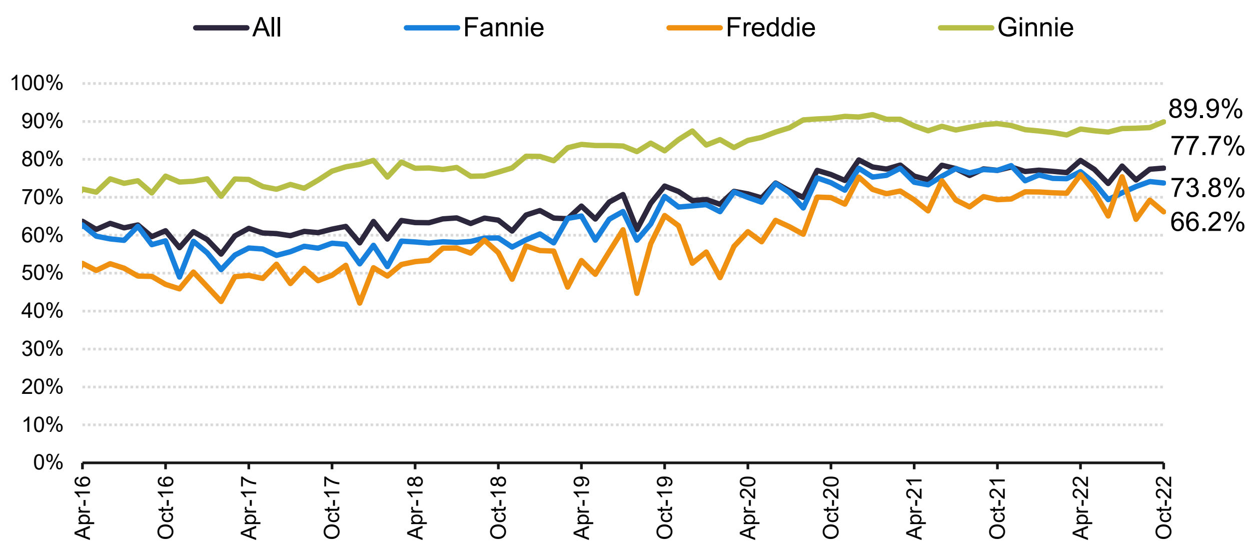


Figure 54. Nonbank Origination Share: Purchase Loans

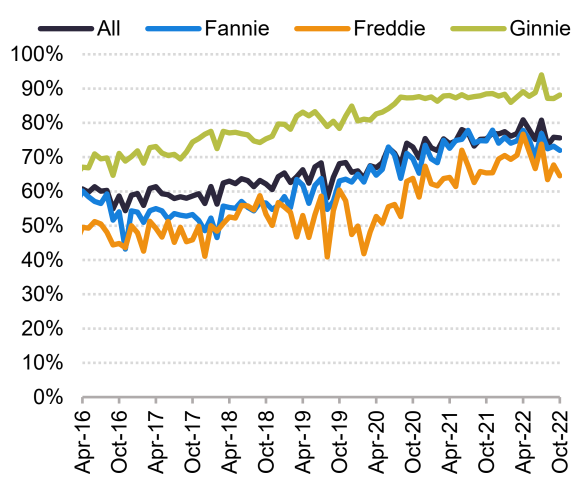
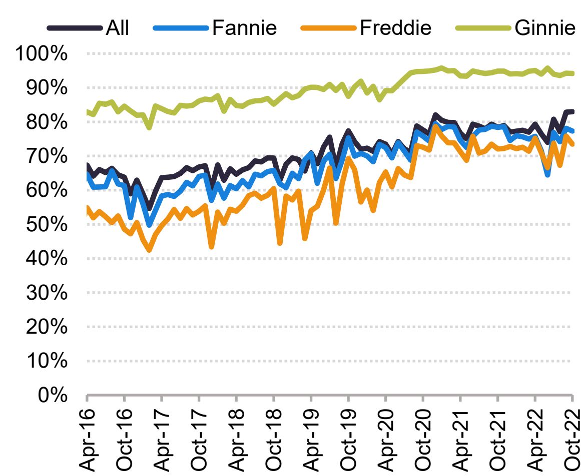


Figure 55. Nonbank Origination Share: Refi Loans



Sources: Recursion. Notes: Data as of October 2022.

Ginnie Mae's total non-bank originator share remained relatively stable in October 2022 Ginnie Mae continues to have a very high proportion of nonbank originations, with a rate of 89.9% in October 2022.

Figure 56. Ginnie Mae Nonbank Originator Share (All, Purchase, Refi)

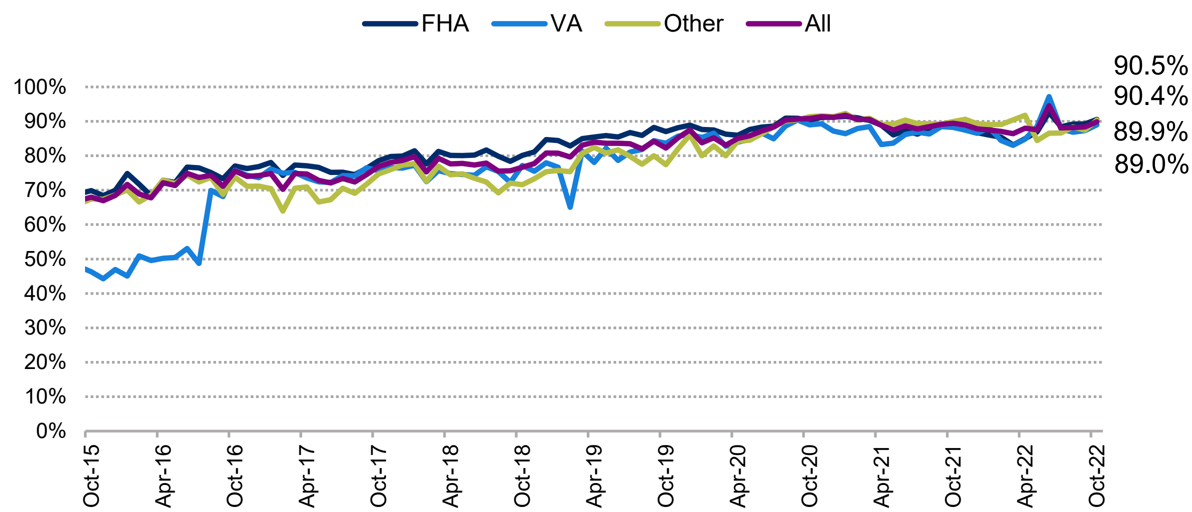


Figure 57. Ginnie Mae Nonbank Share: Purchase Loans

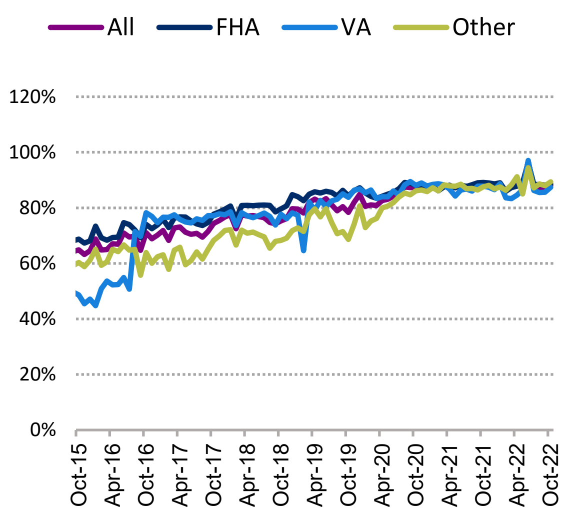
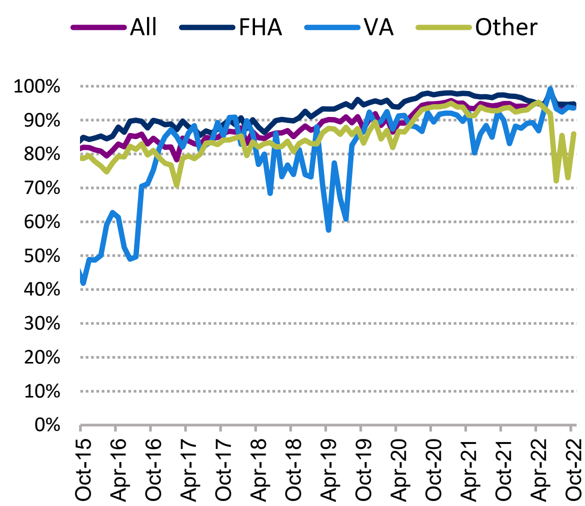


Figure 58. Ginnie Mae Nonbank Share: Refi Loans



Sources: Recursion. Notes: Data as of October 2022.

13.1 Bank vs. Nonbank Originators Historical Credit Box, Ginnie Mae vs. GSE

13.1.1 (FICO, LTV, DTI)

The mortgage loan originations of non-banks continue to have a consistently lower median FICO score than their bank counterparts across all agencies. The spread between non-bank and bank FICO scores increased by 3 points from September 2022 to October 2022. The agency median FICO decreased by 1 to 728 MoM.

Figure 59. Agency FICO: Bank vs. Nonbank

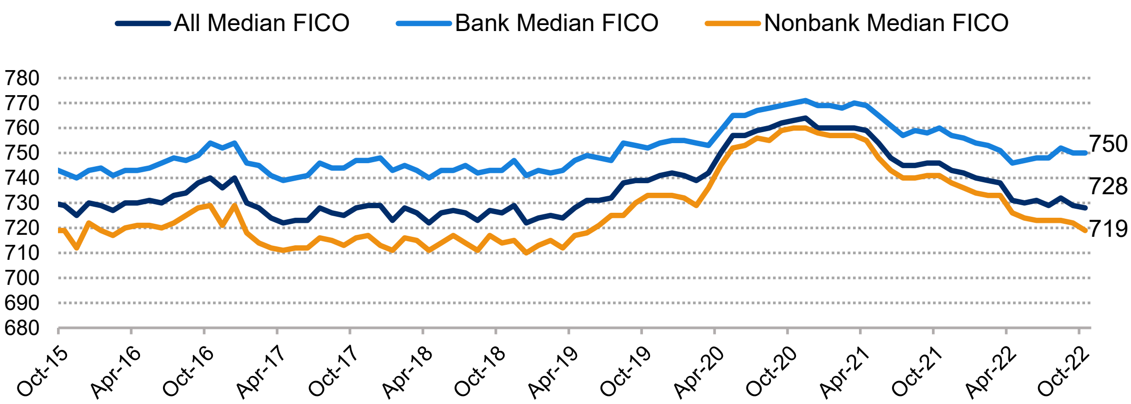


Figure 60. GSE FICO: Bank vs. Nonbank

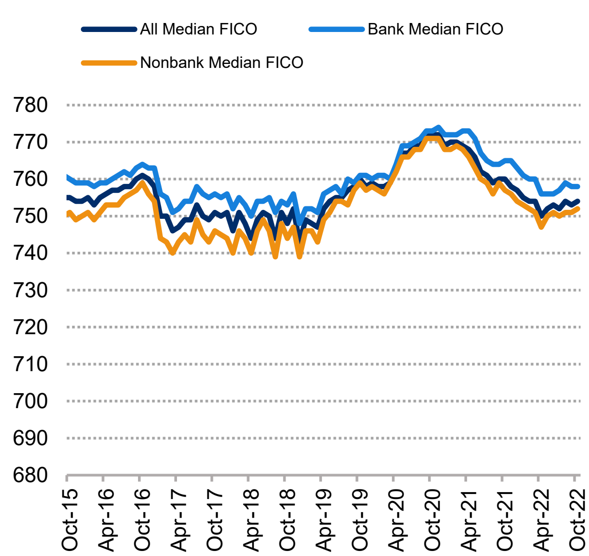
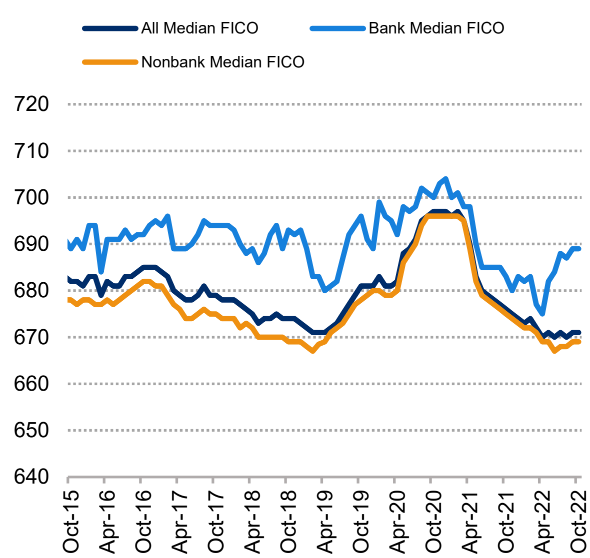


Figure 61. Ginnie Mae FICO: Bank vs. Nonbank



Sources: Recursion: Notes: Data as of October 2022.

The median LTV for all GSE originators remained the same in October 2022 MoM at 80%. Ginnie Mae median bank LTV remained flat at 98.19% MoM and non-bank LTV decreased slightly to 98.18% MoM. Ginnie Mae median DTI remained consistent MoM at approximately 45% in October 2022 in non-bank originations.

Figure 62. GSE LTV: Bank vs. Nonbank

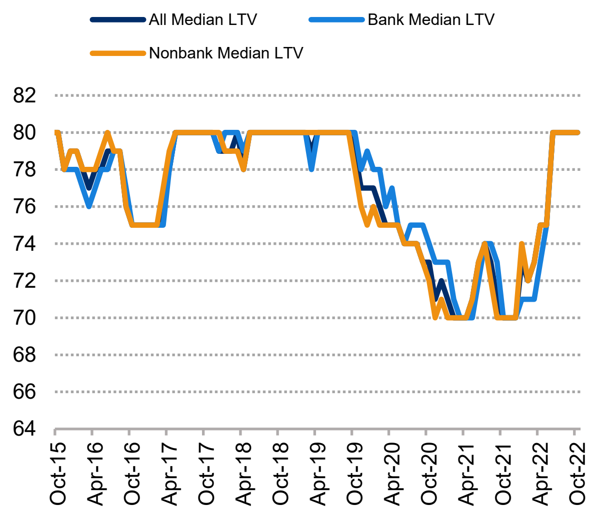


Figure 63. Ginnie Mae LTV: Bank vs. Nonbank

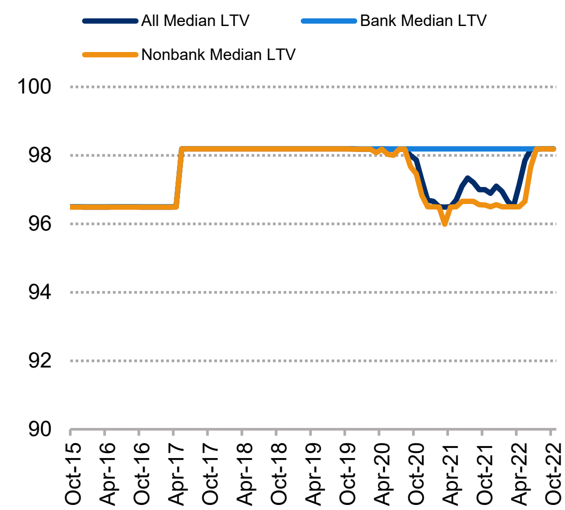


Figure 64. GSE DTI: Bank vs. Nonbank

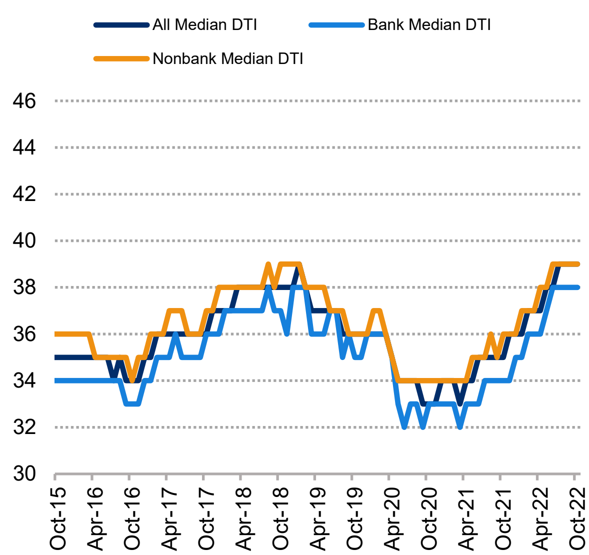
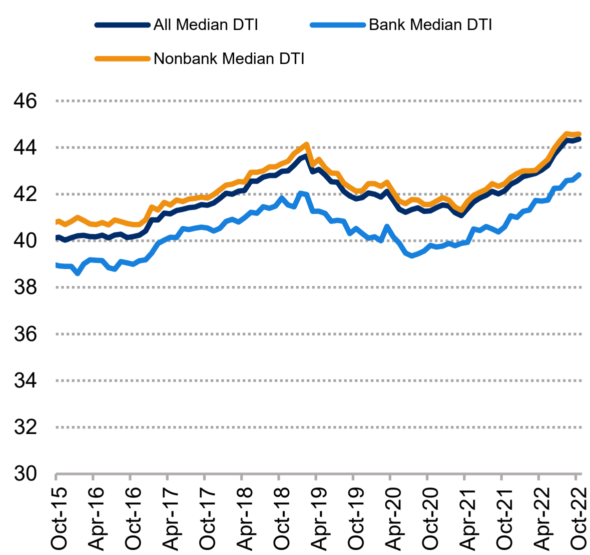


Figure 65. Ginnie Mae DTI: Bank vs. Nonbank



Sources: Recursion. Notes: Data as of October 2022.

In October 2022, the median FICO score for Ginnie Mae bank and non-bank originators remained flat MoM. The median FICO for all Ginnie originations also stayed consistent at 671 MoM. The gap between banks and non-banks is most apparent in VA lending (31-point spread).

Figure 66. Ginnie Mae FICO Score: Bank vs. Nonbank

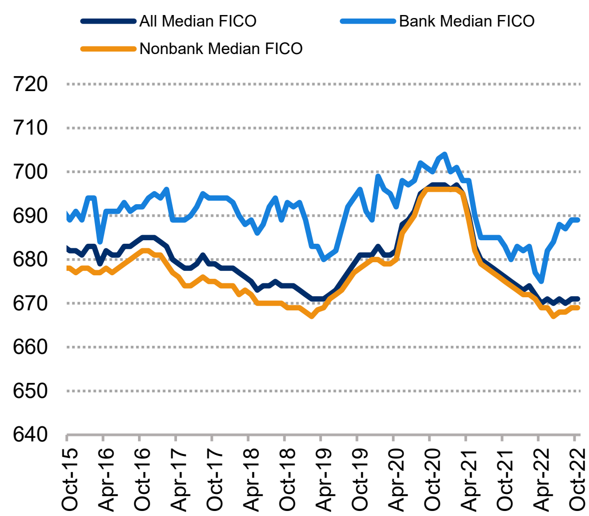


Figure 67. Ginnie Mae FHA FICO Score: Bank vs. Nonbank

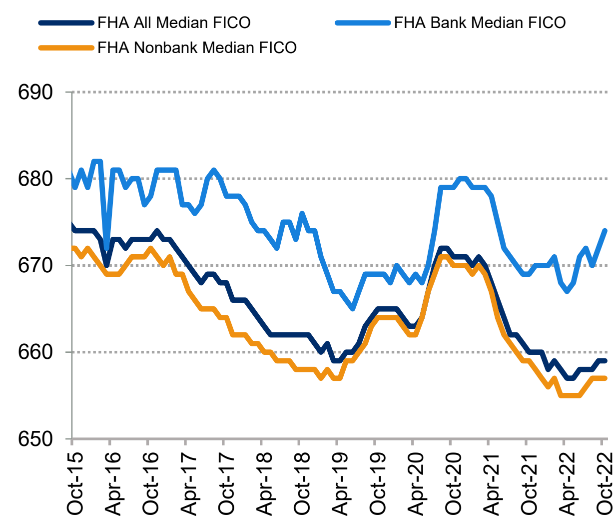


Figure 68. Ginnie Mae VA FICO Score: Bank vs. Nonbank

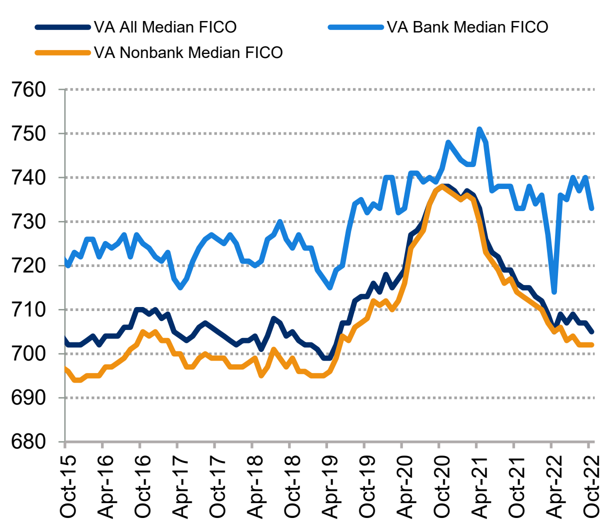
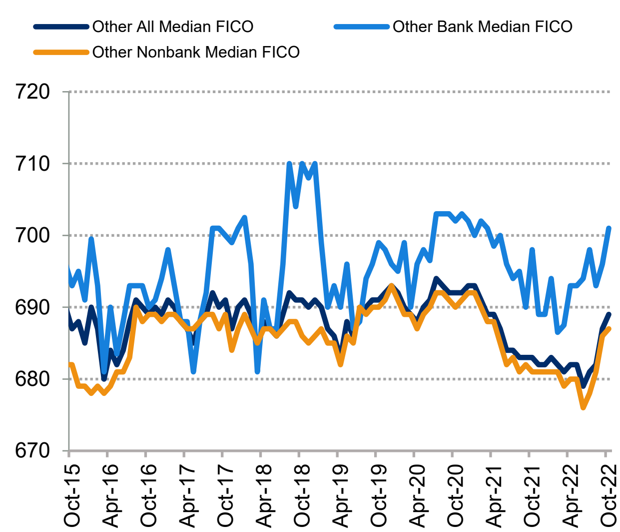


Figure 69. Ginnie Mae Other FICO Score: Bank vs. Nonbank



Sources: Recursion. Notes: Data as of October 2022.

Median DTI for Ginnie Mae nonbank originations has been consistently higher than the median DTI for Ginnie Mae bank originations. This is a trend evident for all Ginnie Mae-eligible loan types except for the "Other" category, where the spread between median bank and nonbank DTI is relatively small.

Figure 70. Ginnie Mae DTI: Bank vs. Nonbank

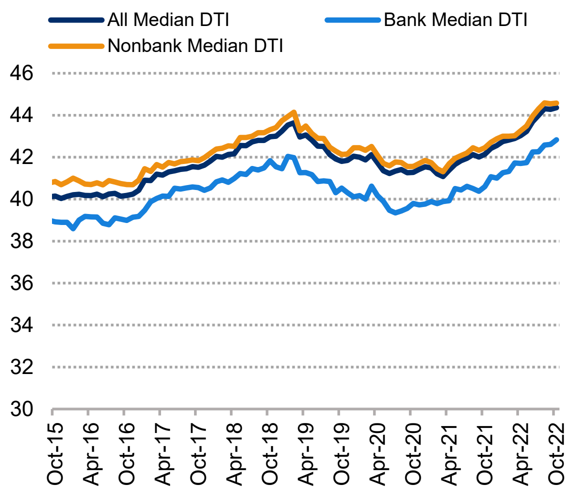


Figure 71. Ginnie Mae FHA DTI: Bank vs. Nonbank

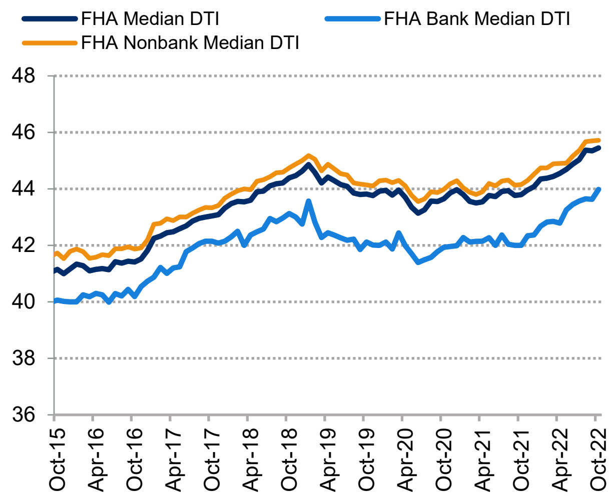


Figure 72. Ginnie Mae VA DTI: Bank vs. Nonbank

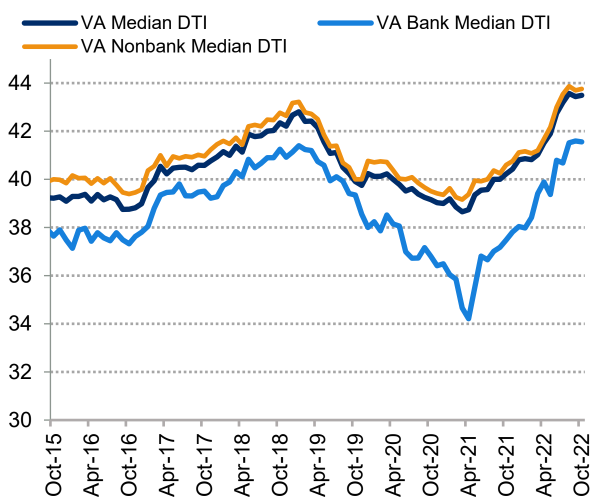
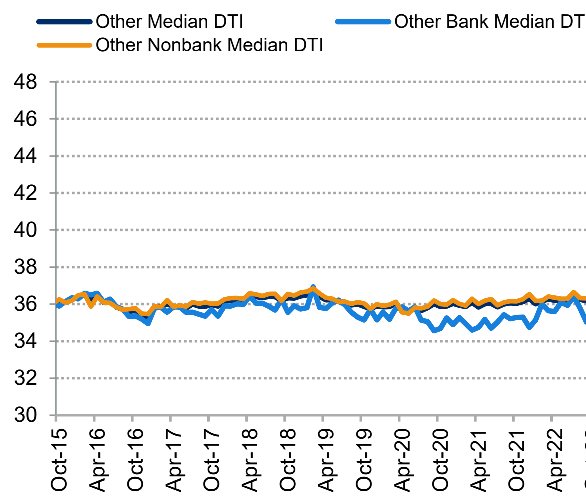


Figure 73. Ginnie Mae Other DTI: Bank vs. Nonbank



Sources: Recursion. Notes: Data as of October 2022.

U.S. HOUSING MARKET

14 HOUSING AFFORDABILITY

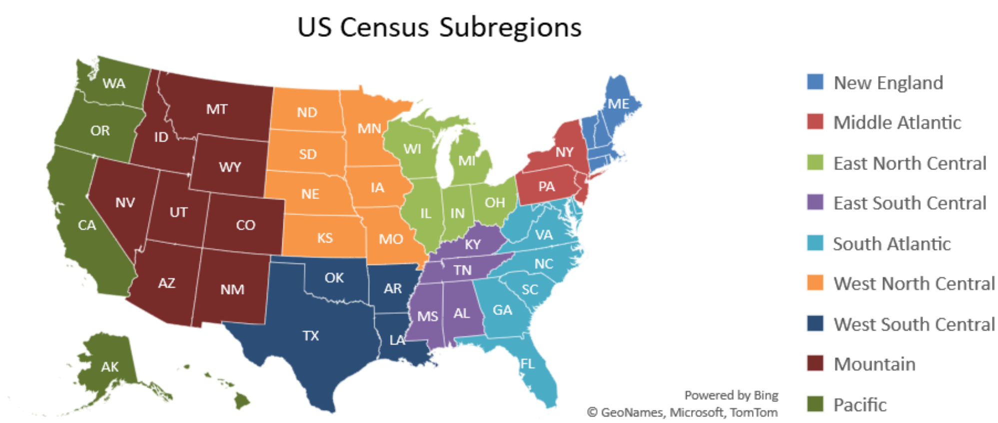
14.1 Housing Affordability – Home Price Appreciation

Home prices are beginning to decelerate, with Compound Annual Growth Rate (CAGR) for HPI at 18.8% between March 2020 and July 2022. Over that same period, the Mountain region has experienced the greatest home price appreciation (22.7% CAGR), while in the West North Central region, increases in home values have remained the slowest (15.7% CAGR).

Table 24. Regional HPI Trend Analysis

U.S. Census Subregion	*New England*	*Middle Atlantic*	*East North Central*	*East South Central*	*South Atlantic*	*West North Central*	*West South Central*	*Mountain*	*Pacific*	*National*
2000 to Peak CAGR	10.5%	8.7%	4.0%	4.5%	8.7%	5.0%	4.3%	8.3%	13.9%	7.1%
Peak to Trough CAGR	-8.4%	-5.3%	-9.8%	-5.5%	-14.2%	-5.7%	-2.1%	-15.6%	-17.9%	-10.4%
Trough to Pandemic CAGR	3.7%	3.5%	4.7%	4.4%	5.9%	4.6%	5.1%	8.3%	8.1%	5.4%
Pandemic CAGR	**18.6%**	**17.0%**	**16.2%**	**19.8%**	**22.3%**	**15.7%**	**18.4%**	**22.7%**	**18.0%**	**18.8%**
12-Month Period of Max HPI Growth During Pandemic	7-2020 to 6-2021	7-2020 to 6-2021	7-2020 to 6-2021	4-2021 to 3-2022	6-2021 to 5-2022	7-2020 to 6-2021	6-2021 to 5-2022	9-2020 to 8-2021	8-2020 to 7-2021	8-2020 to 7-2021
Max 12-Month Period Change, During Pandemic	**21.9%**	**18.1%**	**17.2%**	**21.3%**	**23.9%**	**16.2%**	**19.7%**	**25.6%**	**21.9%**	**19.3%**
12-Month Period of Max HPI Growth, Pre-Pandemic	7-2020 to 6-2021	7-2020 to 6-2021	7-2020 to 6-2021	4-2021 to 3-2022	6-2021 to 5-2022	7-2020 to 6-2021	6-2021 to 5-2022	9-2020 to 8-2021	1-2004 to 12-2004	8-2020 to 7-2021
Max 12-Month HPI Growth, Pre-Pandemic	21.9%	18.1%	17.2%	21.3%	23.9%	16.2%	19.7%	25.6%	22.3%	19.3%

Figure 74. FHFA US Census Subregions as defined by the US Census Bureau.



Source: HPI data from FHFA.US Census Subregions as defined by the US Census Bureau. Notes: HPI data as of May 2022. Peak refers to the month when HPI reached the highest level for each state/US during the housing boom period, ranging from 2005 to 2008. Trough represents the month when HPI fell to the lowest level for each region/US after the housing bust, ranging from 2009 to 2012. Pandemic Period refers to March 2020 to the current period, 3/2022. CAGR = (End Value/Starting Value) ^(1/n) – 1

S&P's CoreLogic Case-Shiller US National Housing Price Index's October 25, 2022, reporting August data indicated that home price gains continued to slow across the country. In August, a 13.0% annual gain was reported, down from 15.6% compared to the month prior. This latest reported MoM HPI appreciation value suggests home prices have started to show signs of deceleration.

Table 25. Home Price Trends by State

State	2000 to Peak	Peak to Trough	Trough to Current	YOY	Current HPI % Above Peak
National	**59.5%**	**-21.2%**	**117.3%**	**11.7%**	**71.3%**
AK	66.9%	-5.4%	53.2%	7.5%	45.0%
AL	41.6%	-15.1%	90.5%	13.3%	61.7%
AR	39.8%	-11.1%	81.1%	12.8%	60.9%
AZ	110.2%	-49.5%	239.4%	18.5%	71.4%
CA	144.8%	-47.1%	172.5%	12.6%	44.3%
CO	32.2%	-10.3%	179.5%	14.5%	150.7%
CT	72.8%	-19.7%	53.3%	10.8%	23.1%
DC	163.1%	-11.7%	123.6%	5.2%	97.4%
DE	88.3%	-23.5%	71.5%	11.7%	31.1%
FL	130.0%	-46.5%	205.8%	21.2%	63.6%
GA	35.9%	-27.1%	154.9%	16.8%	85.8%
HI	139.0%	-27.1%	129.1%	14.0%	67.1%
IA	27.8%	-5.4%	71.5%	9.7%	62.2%
ID	73.3%	-32.2%	252.6%	15.0%	138.9%
IL	49.9%	-23.8%	62.2%	9.6%	23.6%
IN	19.0%	-8.6%	100.4%	11.7%	83.1%
KS	31.0%	-7.7%	86.9%	11.2%	72.5%
KY	28.9%	-5.4%	85.6%	11.4%	75.5%
LA	51.6%	-6.7%	58.5%	8.2%	47.9%
MA	69.9%	-18.3%	98.2%	10.8%	61.9%
MD	126.4%	-26.4%	68.0%	9.9%	23.6%
ME	72.0%	-12.4%	107.5%	15.3%	81.8%
MI	18.4%	-31.6%	137.2%	11.0%	62.2%
MN	52.6%	-23.0%	101.9%	8.9%	55.4%
MO	39.2%	-15.0%	97.6%	12.1%	68.0%
MS	38.9%	-12.8%	64.4%	11.7%	43.4%
MT	79.4%	-13.5%	139.3%	17.9%	107.1%
NC	39.6%	-14.1%	121.9%	17.8%	90.5%
ND	51.6%	-0.8%	84.3%	7.5%	82.8%
NE	24.3%	-5.9%	99.0%	10.8%	87.2%
NH	72.9%	-21.9%	110.4%	14.4%	64.2%
NJ	102.2%	-22.8%	69.2%	11.2%	30.7%
NM	66.5%	-17.9%	77.7%	12.5%	46.0%
NV	117.4%	-59.4%	264.0%	16.8%	48.0%
NY	75.6%	-10.6%	75.8%	11.2%	57.2%
OH	19.5%	-16.6%	99.7%	11.2%	66.6%
OK	36.7%	-4.5%	82.7%	12.3%	74.5%
OR	85.6%	-28.6%	160.2%	11.6%	85.7%
PA	68.8%	-10.9%	75.1%	10.1%	55.9%
RI	108.2%	-28.2%	104.9%	12.5%	47.0%
SC	40.6%	-16.0%	119.1%	15.7%	84.0%
SD	40.2%	-2.3%	100.3%	13.7%	95.6%
TN	38.2%	-12.6%	142.6%	17.9%	112.1%
TX	35.8%	-3.0%	130.8%	14.8%	123.9%
UT	65.1%	-26.0%	202.0%	16.6%	123.3%
VA	95.0%	-18.8%	80.0%	11.4%	46.1%
VT	78.4%	-10.5%	76.7%	11.5%	58.2%
WA	83.3%	-27.3%	184.2%	14.1%	106.6%
WI	38.6%	-14.3%	90.5%	10.8%	63.3%
WV	39.3%	-5.9%	57.6%	11.3%	48.3%
WY	84.6%	-9.7%	75.1%	12.3%	58.1%

Source: FHFA/S&P Corelogic Case-Shiller US National Hosing Price Index Data; Notes: HPI State-level data is provided quarterly by FHFA and presented here as of March 2022. Peak refers to the month when HPI reached the highest level for each state/US during the housing boom period, ranging from 2005 to 2008. Trough represents the month when HPI fell to the lowest level for each state/US after the housing bust, ranging from 2009 to 2012; S&P Corelogic Case-Shiller US National Housing Price Index reported for January 2022 in its Report dated March 29, 2022

14.2 Housing Affordability – Inflation, Wages, and the Price of Real Estate and Rent

While housing affordability is directly affected by real estate price fluctuation, affordability is also impacted by general asset price changes. As of October, inflation has dropped slightly to 7.8%. Nationally, rents are up 7.8 percent YoY, the second time in 2022 that yearly increases have dropped into the single digits. Wage growth is now at 6.4%, a 56.0% YoY increase.

Figure 75. Inflation | 12-Month Percent Change in CPI

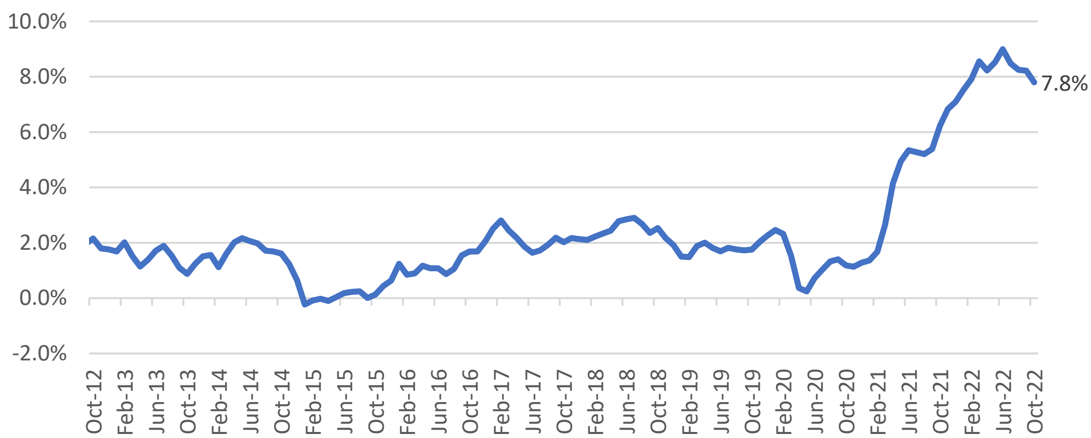
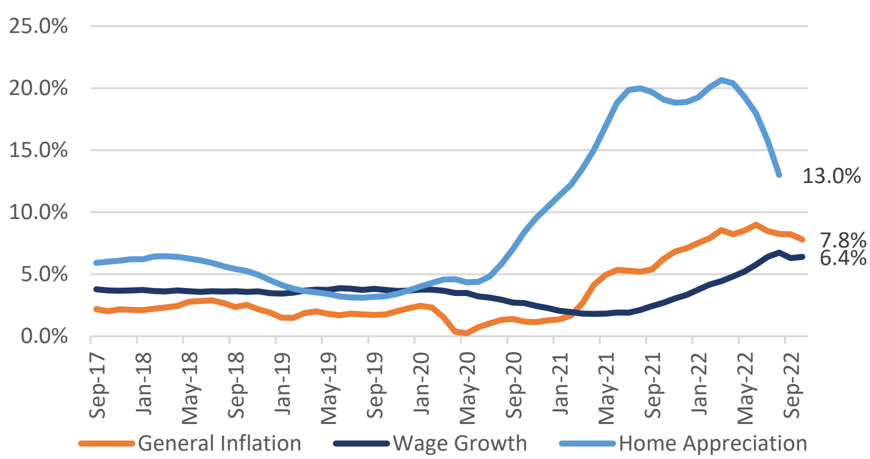


Figure 76. Asset Price Appreciation vs. Wage Increases



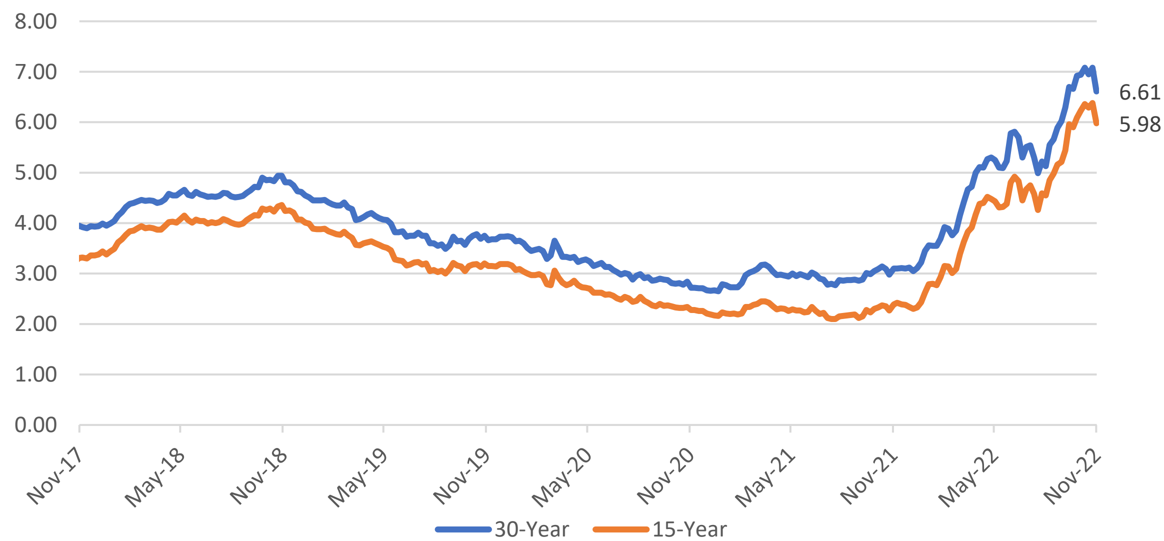
Metric	*Statistic*
General Inflation	*7.8%*
Home Price Appreciation	*13.0%*
Rental Price Appreciation (Median Rent Change YoY)	*7.8%*
Wage Growth	*6.4%*

Sources: Bureau of Labor Statistics – Consumer Price Index and Wage-Growth Data; Rent.com - Rental Price Appreciation; S&P/Case-Schiller U.S. National Home Price Index – Home Price Appreciation.

14.2.1 Housing Affordability – Mortgage Rate Trends

Although the Federal Funds Target Rate was raised in September 2022 by 75 bps to a range of 3.00%-3.25%, the Fed hiked the interest rate again by another 0.75% in November- the six consecutive increase in 2022.[2] At the end of October, average 30-year fixed rate mortgage rates were over 7.0% for the first time in 20 years. As of November 17, 2022, the average 30-year and 15-year fixed rate mortgage rates were 6.61% and 5.98% respectively. The average 30-year fixed rate mortgage decreased 31 bps and the average 15ear fixed rate mortgage decreased 11 bps compared to the prior month, showing a deceleration of mortgage rates.

Figure 77. Average Fixed Rate Mortgage Rates



Sources: FRED data as of November 2022

[2] https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a1.htm#:~:text=The%20Board%20of%20Governors%20of,%2C%20effective%20November%203%2C%202022

14.3 Housing Inventory

As of September, there was 9.2 months of housing inventory on the market. September housing inventory values were up by 13.6% MoM. As housing affordability continues to remain high (See above section 14.2) single-family home sales are unlikely to play a large role in the resolution of the housing shortfall. Multifamily construction volume metrics, shown in **Figure 79**, have been increasing.

Figure 78. Single-Family Housing Inventory

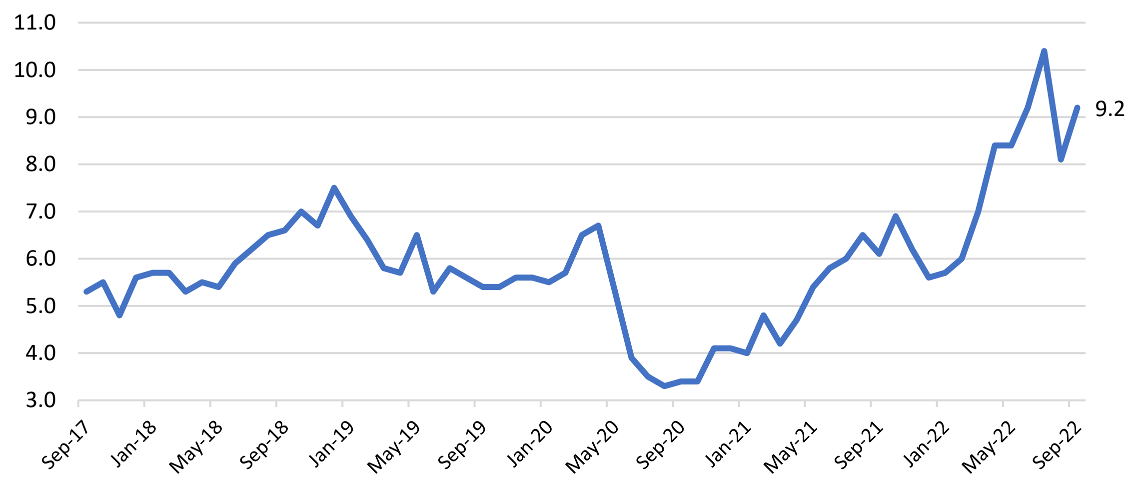
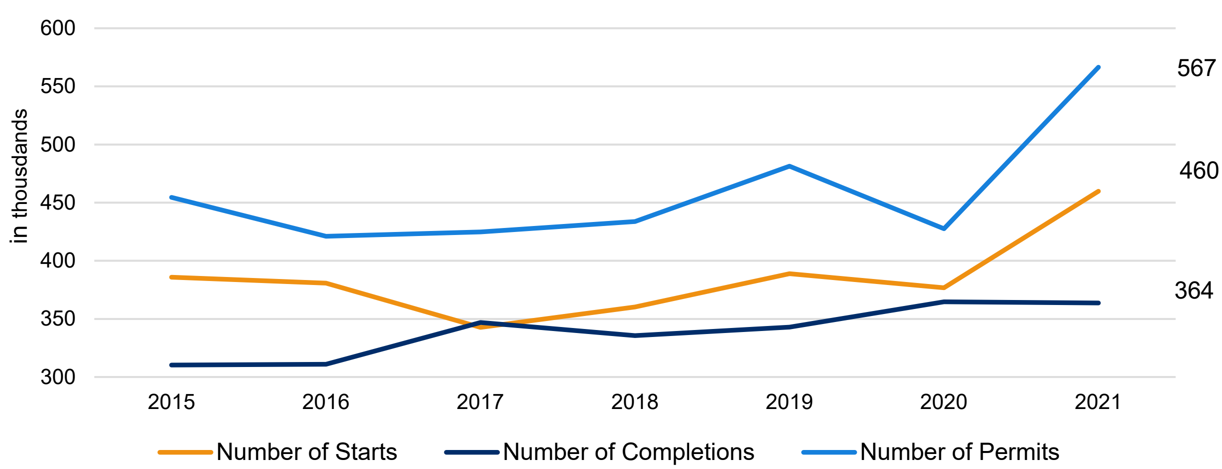


Figure 79. Multifamily Construction Metrics: Permits, Starts, Completions



Source: FRED data as of September 30, 2022 and New Residential Construction, US Census Bureau

14.4 Size and Value of the US Housing Market

The total value of the single-family housing market reached $41.1 trillion in Q2 2022. The total value of the US housing market is up 102% from its trough in 2011. Over that same period, mortgage debt outstanding has increased by just 10%. From Q4 2021 to Q2 2022 mortgage debt outstanding increased from $11.7 trillion to $12.1 trillion and household equity increased from $26.3 trillion to $29.0 trillion. Thus, the expansion in the housing market is being driven primarily by increases in home values, as illustrated in the Housing Affordability Section. At $8.71 trillion in Q2 2022, agency SF MBS account for a growing percentage of the total mortgage debt outstanding, up to 67% of total mortgage debt from just 52% in 2011.

Figure 80. Value of the US Housing Market.

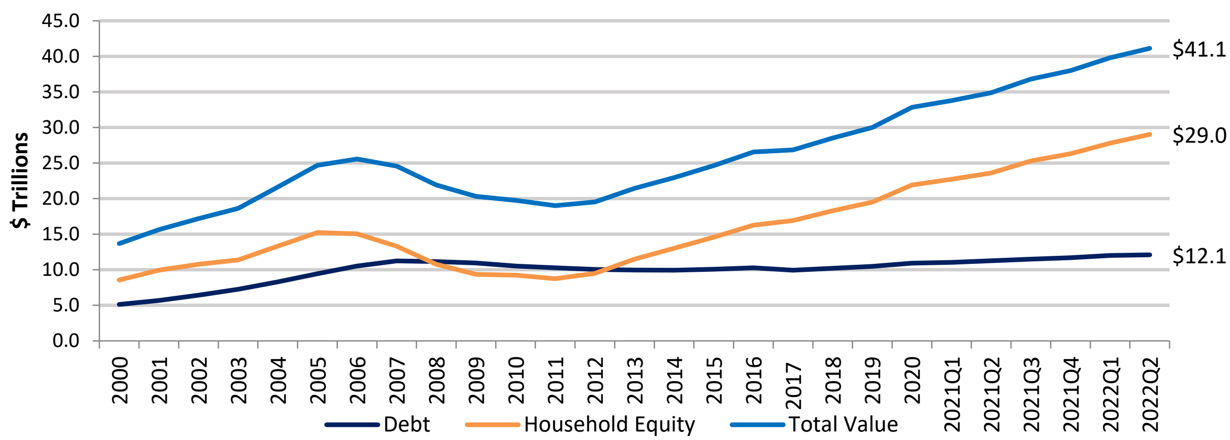
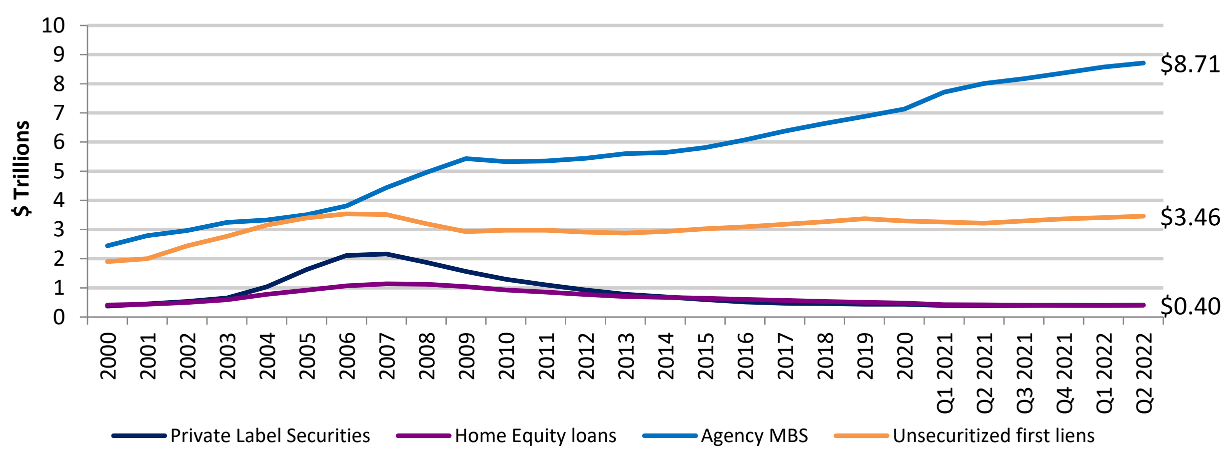


Figure 81. Size of the US Residential Mortgage Market.



Sources:

1. *Federal Reserve Flow of Funds Data. Notes: Data as of Q2 2022.*
2. *Idzelis, Christine. "Fed May Need to Be Even More Aggressive Fighting Inflation as U.S. Household Cash Exceeds Debt for First Time in Three Decades, Warns Deutsche Bank." MarketWatch, MarketWatch, 20 Apr. 2022, https://www.marketwatch.com/story/fed-may-need-to-be-even-more-aggressive-fighting-inflation-as-u-s-household-cash-exceeds-debt-for-first-time-in-three-decades-warns-deutsche-bank-11650474606.*

15 DISCLOSURE

"The data provided in the Global Markets Analysis Report (hereinafter, the "report") should be considered as general information only and is current only as of its specified date, unless otherwise noted. No information contained herein is, and should not be construed to be, investment advice. Nor does any information contained herein constitute an offer to sell, or is a solicitation of an offer to buy, securities.

The information contained herein is based upon information generally available to the public from sources believed to be reliable as of the specified date. The accuracy of the information contained herein is based on the corresponding accuracy of the issuer data as reported to the Government National Mortgage Association (hereinafter, "Ginnie Mae").

Therefore, if there is insufficient or inaccurate data to support calculations of any specific disclosure information, Ginnie Mae disclaims any and all liability relating to that information, including, without limitation, any express or implied representations or warranties for statements or errors contained in, or omissions from, the report.

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