

GLOBAL MARKETS ANALYSIS REPORT

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



December 2022

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

This month's *Highlights* section calls attention to the recent phenomenon of increasing spreads between Ginnie Mae II Single Family MBS and US 10-yr Treasury yields despite consistent month-over-month decreases in MBS production. The section also covers production trends between the agencies, revealing that gross MBS production has been declining at higher rates for the GSEs than for Ginnie Mae. While net MBS issuance has dropped for the GSEs, net issuance for Ginnie Mae is growing.

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

Even though the production of MBS has declined consistently month after month in 2022 (see [Section 5.3](#)), spreads on Ginnie Mae MBS have remained wide on a relative basis throughout the year. At month's end November 2022, Ginnie Mae II Single-Family MBS recorded a yield of 5.03% compared to the US 10-Yr yield at 3.61% as illustrated in **Figure 1**. This is a 321 bp YoY increase for the Ginnie Mae II Single-Family MBS yield from 1.82% at month-end November 2021.¹

Figure 1. Ginnie Mae II Single Family Index versus US Treasury 10-yr Yields



The total issuance of Ginnie Mae MBS decreased from \$62.3 billion in January 2022 to \$36.0 billion in November 2022. This is a monthly rate of decline of approximately 4.9%.² Even though there is a slowdown in Ginnie Mae MBS production, prepayments have slowed at an even greater rate, currently driven by seasonality and a higher interest rate environment (see [Section 4](#)). In November 2022, Ginnie Mae fixed rate aggregate prepayment speeds decreased by 21.4% MoM. As shown in **Figure 3**, the total remaining principal balance of Ginnie Mae I and II is \$2.3 trillion in November 2022—a \$19 billion increase from October 2022 and a \$157 billion increase from January 2022.³

¹ Bloomberg data as of November 2022

² https://www.ginniemae.gov/data_and_reports/reporting/MonthlyIssuanceReports/Nov22_ISS.pdf

³ https://www.ginniemae.gov/data_and_reports/reporting/Monthly%20UPB%20Reports/Oct22_RPB.pdf

Figure 2. Total Issuance of Ginnie Mae I and II

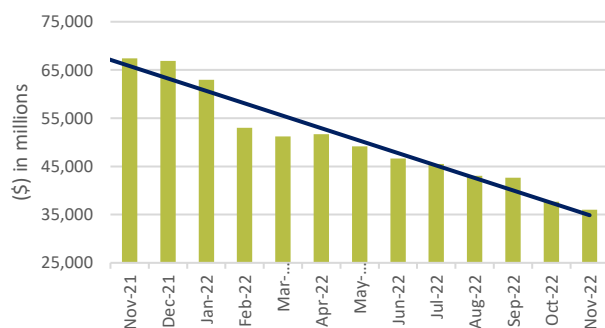
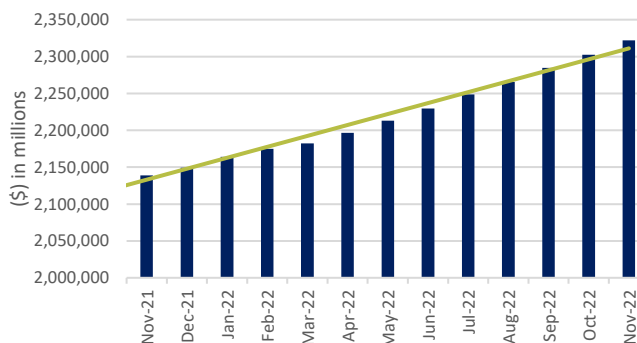
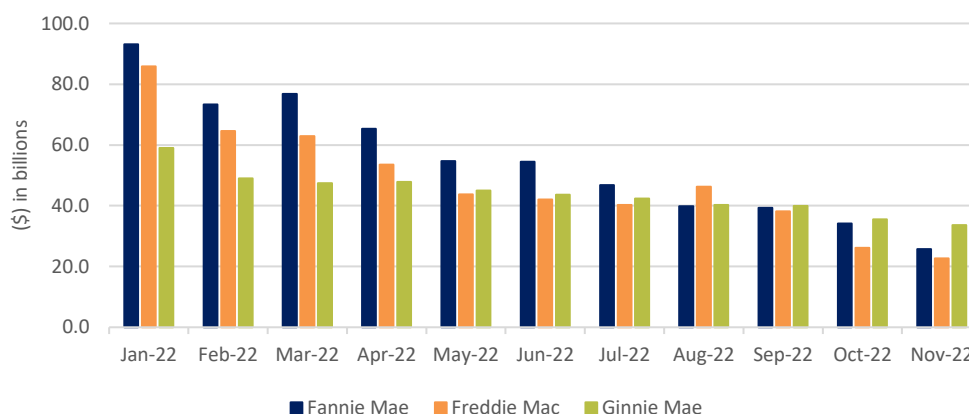


Figure 3. Total Remaining Principal Balance



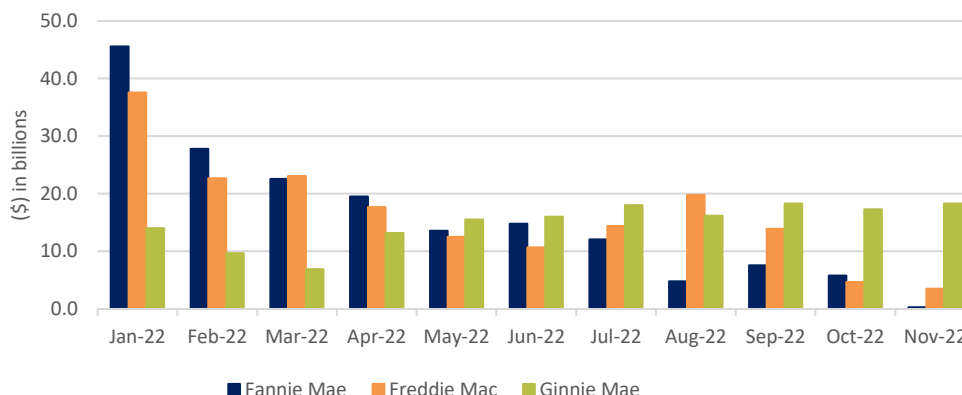
In January 2022, the gross MBS issuance amount was \$59 billion for Ginnie Mae, \$85.9 billion for Freddie Mac, and \$93.1 billion for Fannie Mae (see [Section 5.3](#)). In November 2022, the gross issuance amount for Ginnie Mae was \$33.6 billion, \$22.7 billion for Freddie Mac, and \$25.7 billion for Fannie Mae. While Ginnie Mae gross issuance has decreased by 43.1% since January 2022, Fannie Mae and Freddie Mac gross issuance levels have decreased by 72.4% and 73.6% respectively, as illustrated in **Figure 4**. Although Ginnie Mae gross issuance has dropped consistently throughout 2022 (average growth rate of -5.3%), gross issuance for Freddie Mac and Fannie Mae have been consistently declining at over double the rate of Ginnie Mae, with approximately 12.5% and 12.1% monthly rates of decline in issuance respective.

Figure 4. Agency Gross Issuance Amount



As agency gross issuance amounts have dropped, Ginnie Mae net issuance has increased while Fannie Mae and Freddie Mac net issuance has dropped significantly. In January 2022, the net issuance amount was \$14 billion for Ginnie Mae, \$37.6 billion for Freddie Mac, and \$45.6 billion for Fannie Mae (see [Section 5.3](#)). In November 2022, the net issuance amount for Ginnie Mae was \$18.3 billion, \$3.5 billion for Freddie Mac, and only \$300 million for Fannie Mae. Since January 2022, Fannie Mae net issuance has declined by 99.3% and Freddie Mac net issuance has also declined by 90.7% while Ginnie Mae net issuance has grown by 30.7% as shown in **Figure 5**.

Figure 5. Agency Net Issuance Amount



Despite the decrease YTD 2022 in MBS production, the spread between GN II SF and the US 10-Yr remains relatively wide. As depicted in **Figure 6**, the spread over the last five years was at its widest, at 187 bps, in September 2022 when the GN II SF yield was at 5.79% and the US 10-Yr at 3.92%.⁴

At month-end November 2022, the spread between the GN II SF and the US 10-Yr was 143 bps—a 2.86% YoY increase from a spread of 37 bps in November 2021.

Figure 6. Spread between GN II SF and US 10-Yr Treasury



Current MBS production volume is projected to remain relatively stable through the end of Q1 2023, per the Mortgage Bankers Association (MBA) November 21, 2022 forecast (Q4 2022 production volumes of \$398 billion compared to \$392 billion projections in Q1 2023). The MBA forecasts that the pace of mortgage loan originations is driven by a decline in refinancing share from 58% in 2021 to 30% in 2022 and dropping again to 24% in 2023.⁵

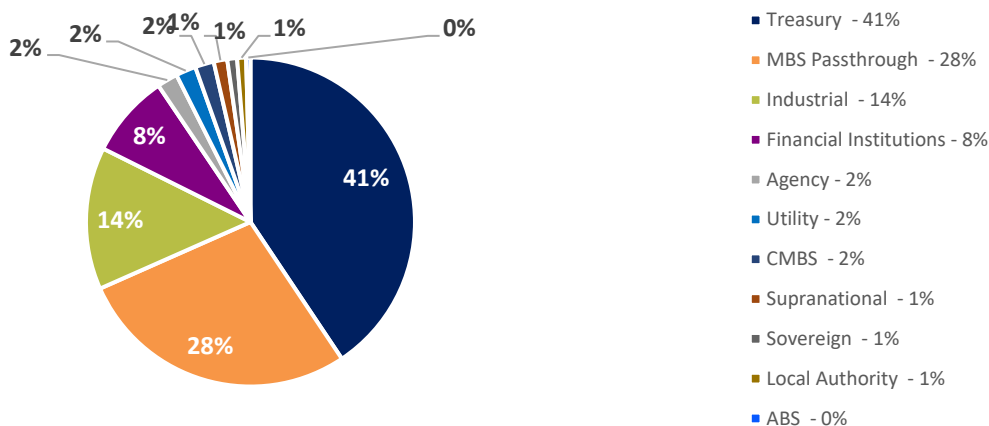
⁴ Bloomberg data as of November 2022

⁵ https://www.mba.org/docs/default-source/research-and-forecasts/forecasts/mortgage-finance-forecast-nov-2022.pdf?sfvrsn=a8e2944_1

1 US AGGREGATE AND GLOBAL INDICES

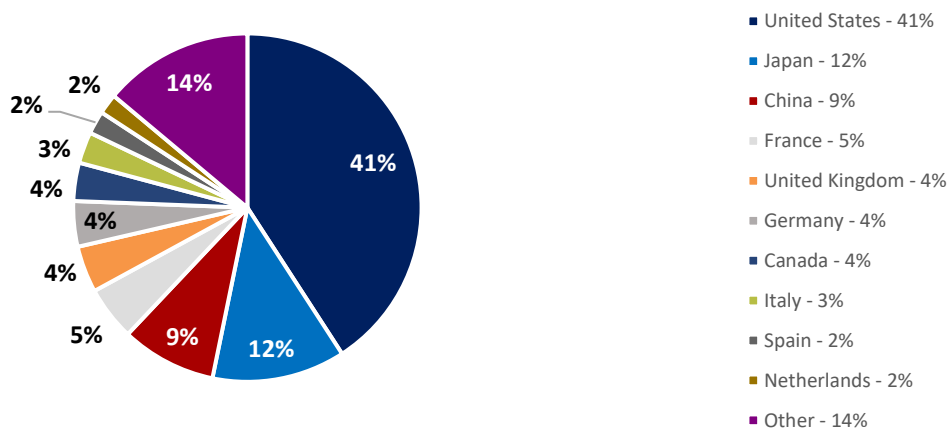
1.1 Bloomberg US Aggregate and Global Indices

Figure 7. Bloomberg US Aggregate Index.



At month-end November, 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 8. 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%. For the Global Aggregate Index, all countries remained stable when compared to the prior month with no changes larger than 1%.

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

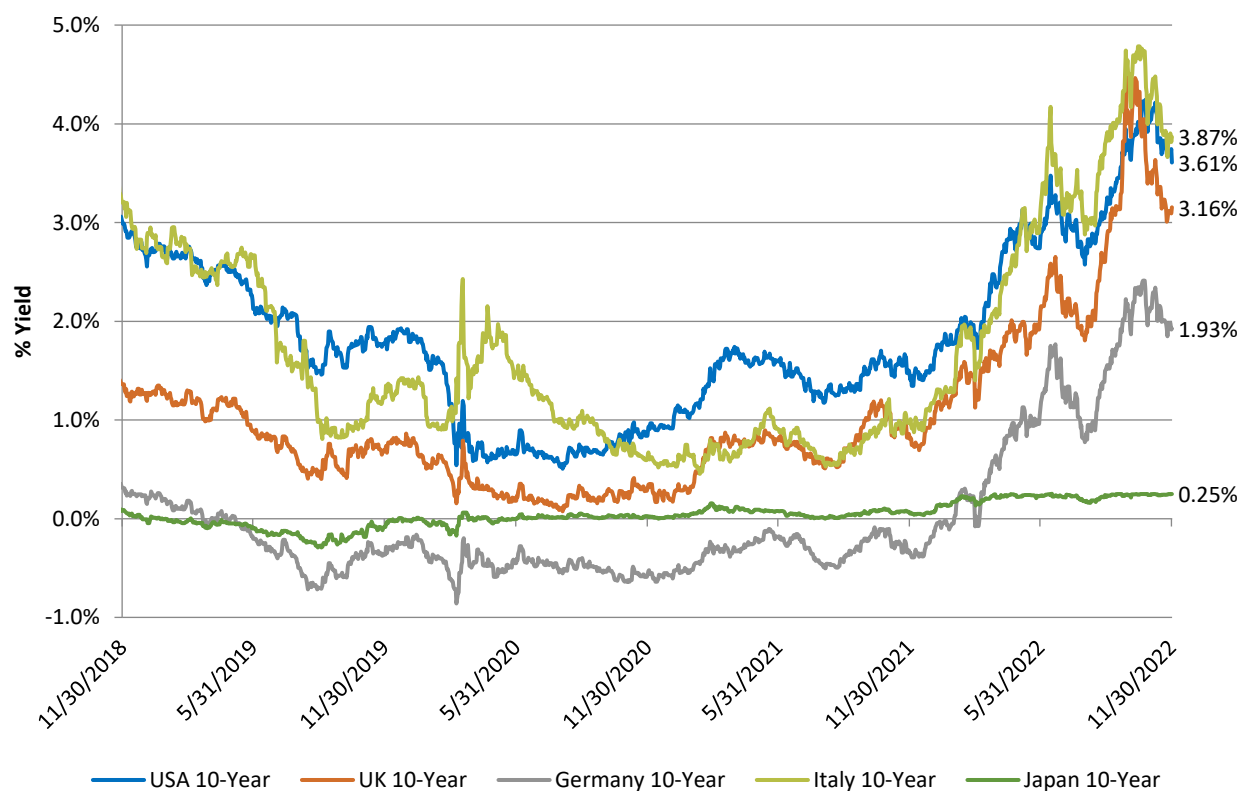
2 SOVEREIGN DEBT PRODUCT PERFORMANCE COMPARISONS

2.1 Global 10-Year Treasury Yields (Unhedged)

The US 10-year Treasury yield moved to 3.61% at month-end November 2022, a MoM decrease of 44 bps. US Treasury yields remain the 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 3.16% at month-end November, a MoM decrease of 35 bps.
- The yield on the German 10-year notes decreased to 1.93% at month-end November, a MoM decrease of 21 bps.
- The yield on the Italian 10-year note decreased to 3.87% at month-end November, a MoM decrease of 42 bps.
- The yield on the Japanese 10-year notes decreased to 0.25% at month-end November, a MoM decrease of 1 bps.

Figure 9. 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 increased MoM 5 bps to 2.17% at month-end November.

The hedged yield for the 10-year Treasury EUR increased MoM 4 bps to 1.25% at month-end November.

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



Figure 11. 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 decreased MoM in November 2022. Ginnie Mae II yields were at 5.56% at month-end September, increased 16 bps to 5.72% at month-end October and have now decreased to 5.03%, a 69 bps decrease. Ginnie Mae I yields were at 5.51% at month-end September, increased 13 bps to 5.64% at month-end October, and have now decreased 65 bps to 4.99%. Ginnie Mae II spreads over the US 10-year Treasury yield, just 37 bps at month-end November 2021, had increased 106 bps to 143 bps over the US 10-year Treasury yield at month-end November 2022. The yields on the Ginnie Mae I SF were 139 bps higher than the US 10-year Treasury yield at month-end November, a decrease in spread of 20 bps MoM but an increase of 84 bps YoY.

Figure 12. Ginnie Mae II SF Yield, USD



Figure 13. 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 decreased by 8 bps to 0.58% at month-end November. The Ginnie Mae II 30-year OAS decreased 13 bps MoM. The US Intermediate credit OAS has decreased 22 bps MoM.

Figure 14. US GNMA II 30yr MBS OAS versus US Intermediate Credit OAS.

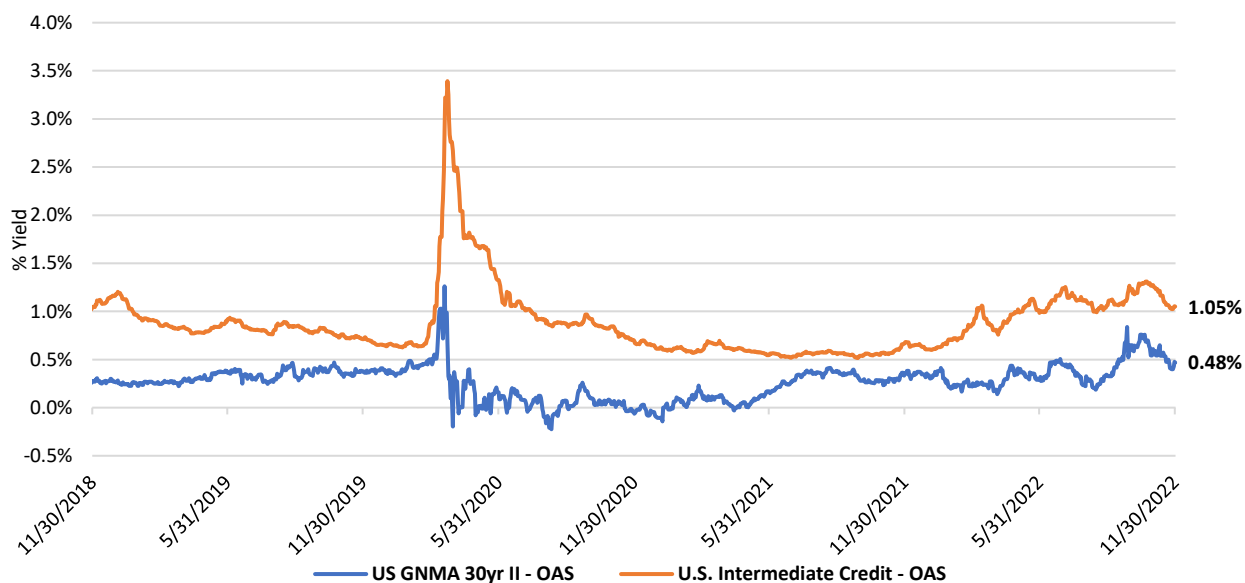


Figure 15. Spread between US Intermediate Credit and US GNMA II 30yr MBS OAS.

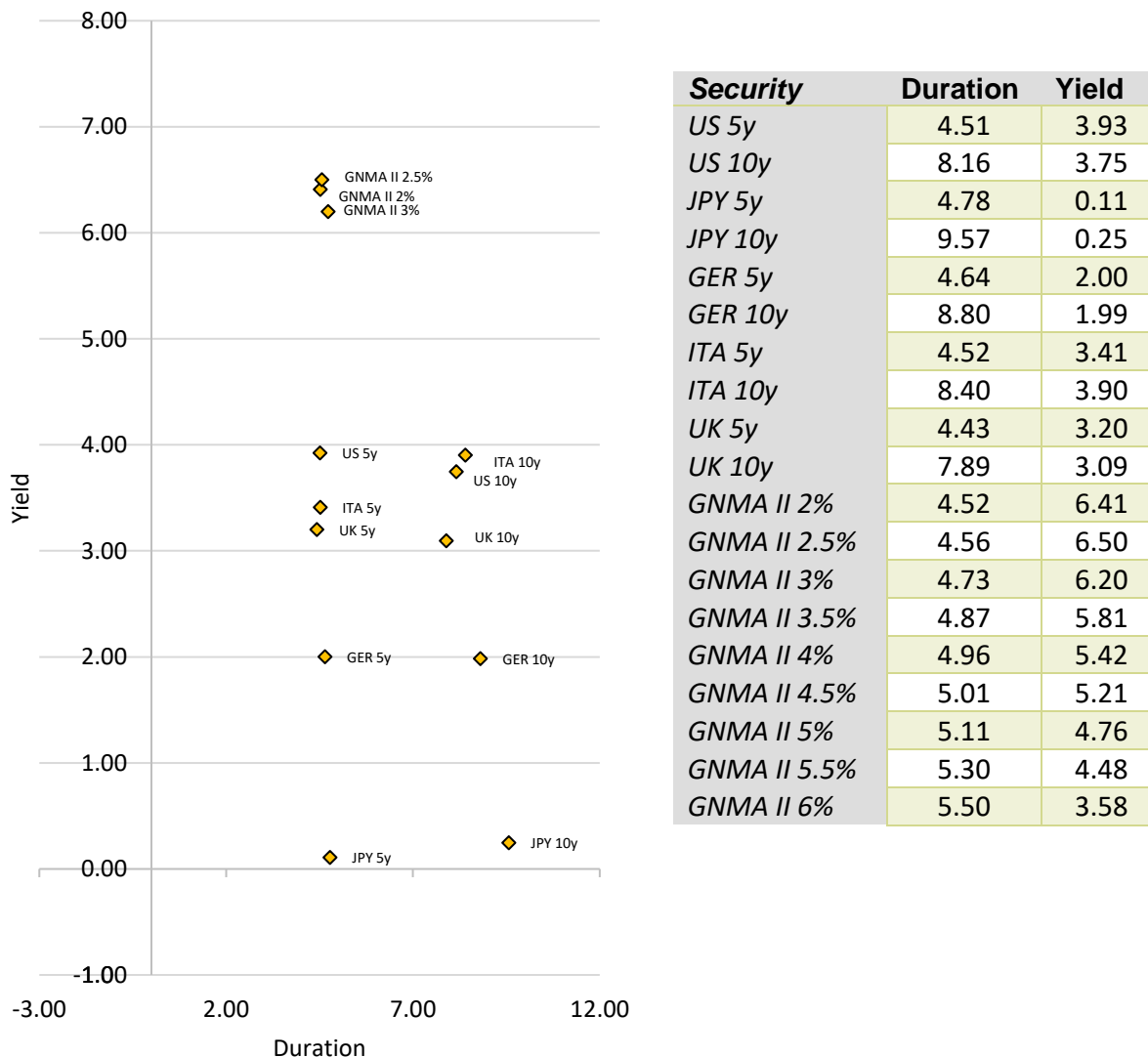


Source: Bloomberg. Note: Data as of November 2022.

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 GNMA II securities, decreases in duration have been observed relative to the month prior.

Figure 16. Yield vs. Duration



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 November 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 November by 21.4% MoM, while Fannie Mae and Freddie Mac CPRs decreased by 15.5% and 15.9%, respectively. ARM prepayments have dropped for all three agencies, due to decreased refinance activity in the current higher interest rate environment.

Figure 17. Fixed Rate Aggregate 1-Month CPR.

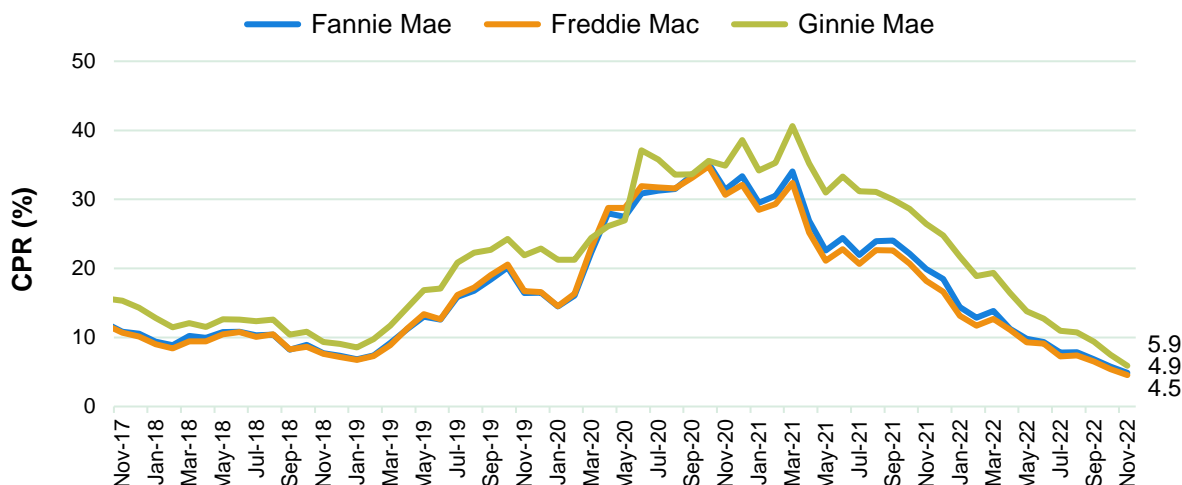
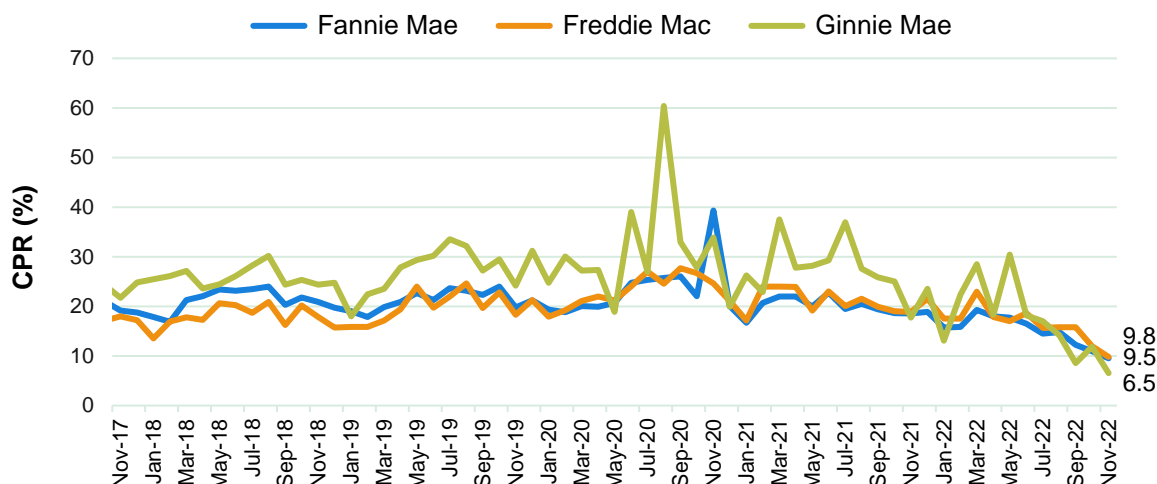


Figure 18. ARM Aggregate 1-Month CPR.



Source: Recursion. Note: Data as of November 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 and GSE prepayments has converged significantly since Ginnie Mae's CDR peak of 12.4 CDR in June 2020. ARM CDRs for Freddie Mac continued to remain below Ginnie Mae in November 2022 after slightly overtaking Ginnie Mae in September 2022.

Figure 19. Fixed Rate Aggregate CDR.

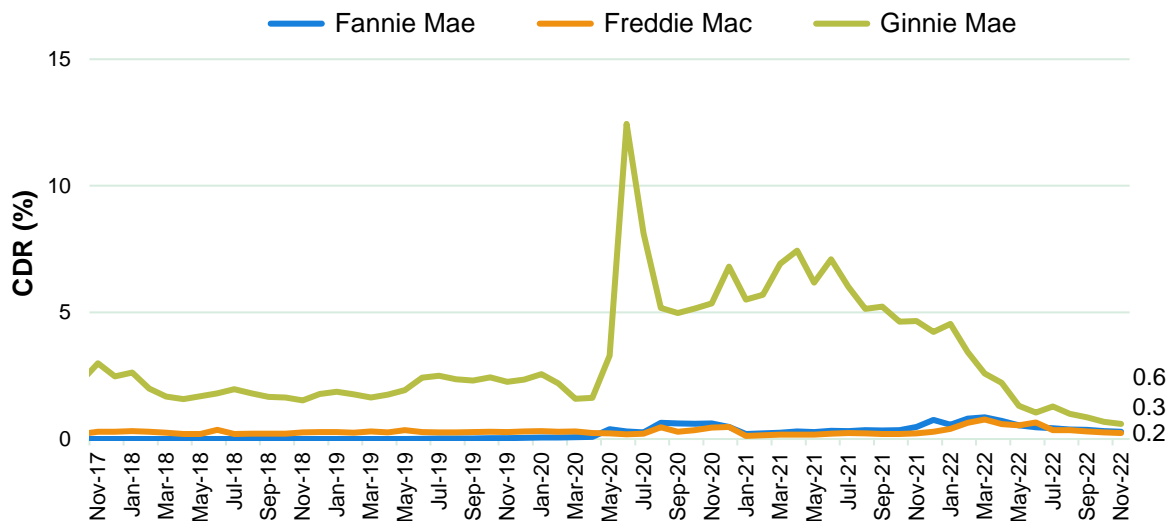
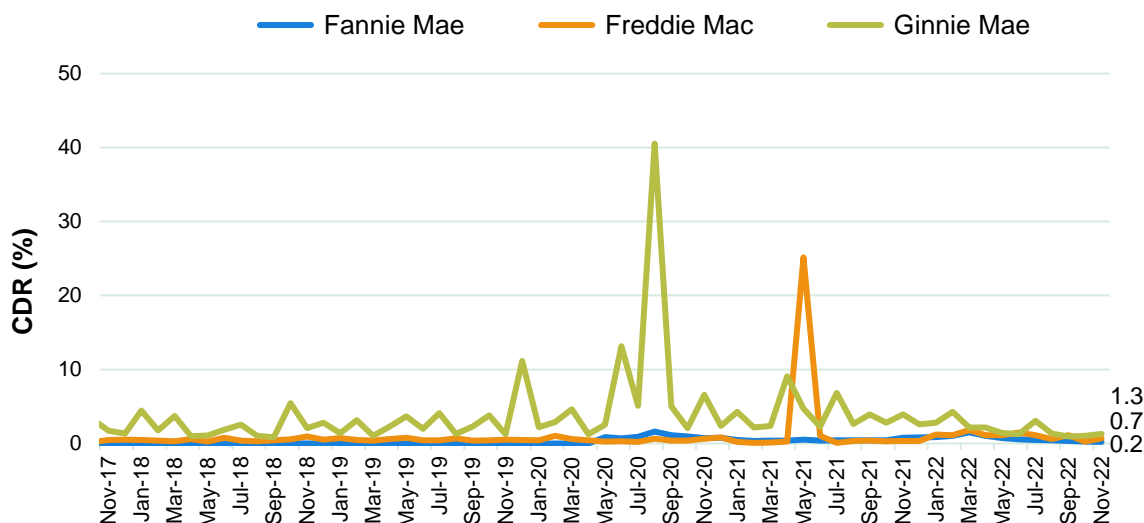


Figure 20. ARM Aggregate CDR.



Source: Recursion. Note: Data as of November 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 16.1% MoM in fixed rate aggregate CRR, respectively. Freddie Mac saw a 21.8% MoM decrease and Fannie Mae saw a 13.1% MoM decrease in ARM aggregate CRR. Ginnie Mae decreased 22.4% MoM in fixed rate aggregate CRR and saw a 51.2% MoM decrease in ARM aggregate CRR.

Figure 21. Fixed Rate Aggregate CRR.

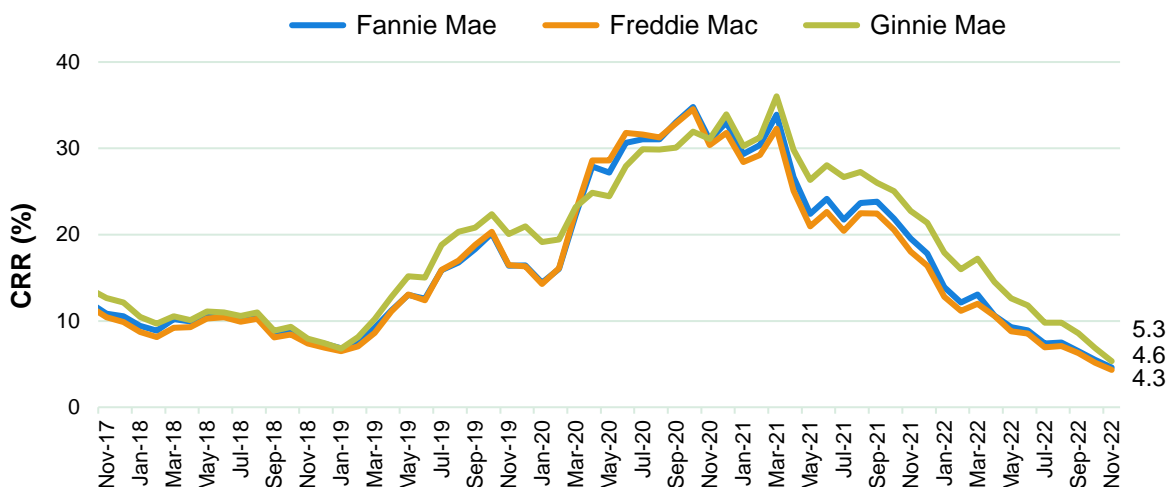
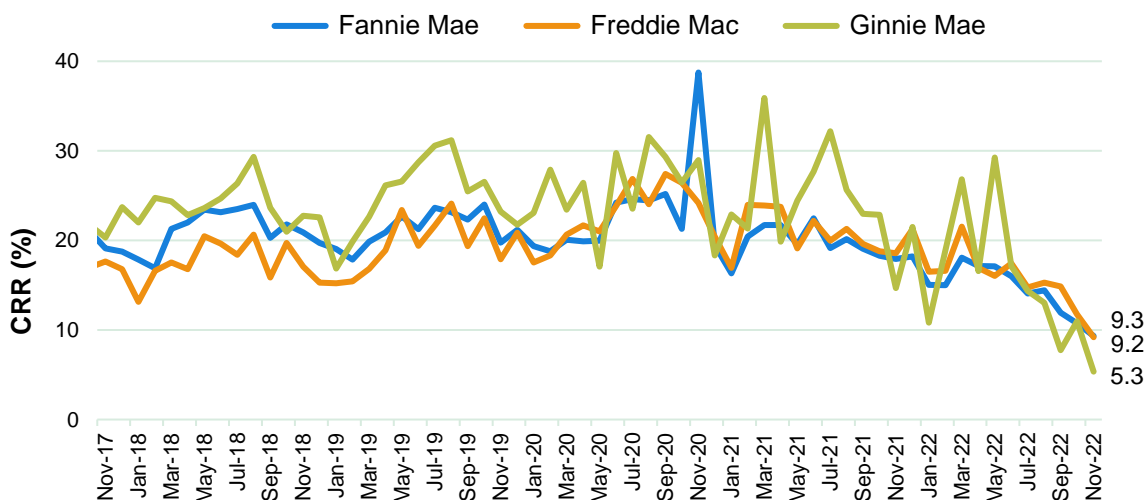


Figure 22. ARM Aggregate CRR.



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

5 SINGLE-FAMILY MBS PASS-THROUGH ISSUANCE

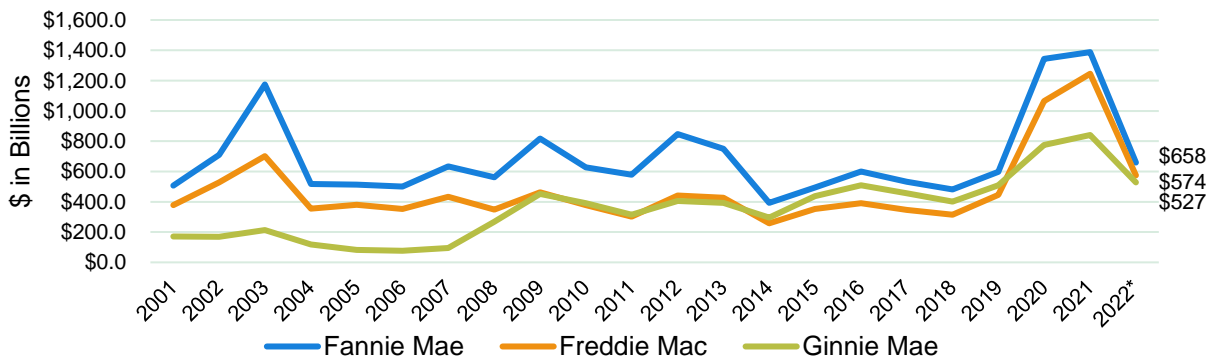
5.1 Gross Issuance of Agency MBS

Agency gross MBS issuance decreased MoM by 14.3%. All three agencies saw decreases in gross issuance as compared to November.

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	\$603.4	\$526.1	\$1,129.5	\$483.5	\$1,613.0
2022 Annualized	\$658.3	\$573.9	\$1,232.2	\$527.4	\$1,759.6

Figure 23. Agency Gross Issuance



*2022 values have been annualized – the annualization methodology is not seasonally adjusted.

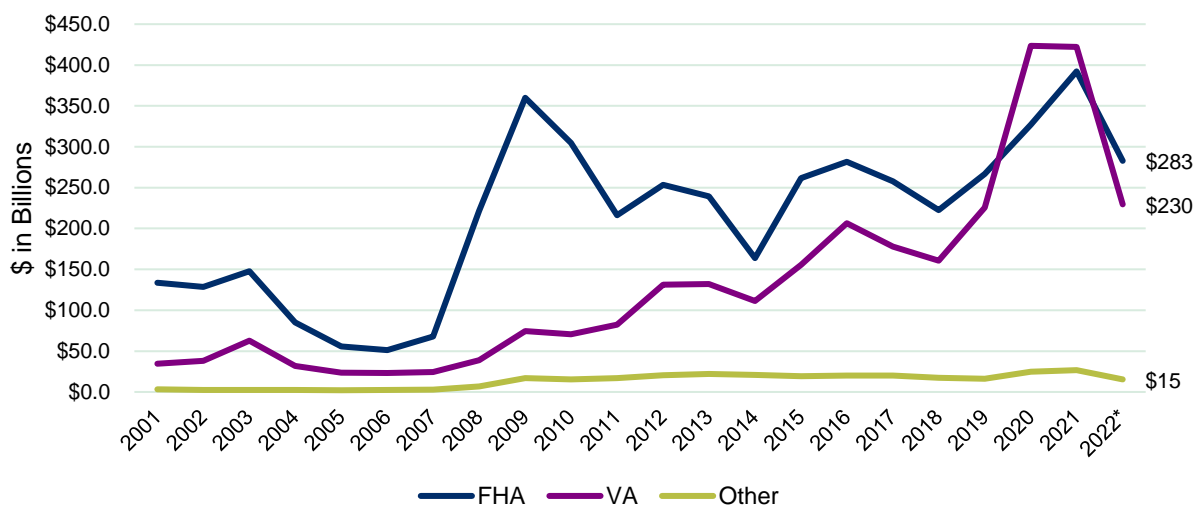
Note: Numbers are rounded to the nearest hundred million. For sums, like “GSE Total”, the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

Ginnie Mae's \$33.6 billion in gross issuance in November was approximately 52% 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 \$313.5 billion.

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

<i>Issuance Year</i>	<i>FHA</i>	<i>VA</i>	<i>Other</i>	<i>Total</i>
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	\$259.1	\$210.3	\$14.1	\$483.5
2022 Annualized	\$282.6	\$229.5	\$15.4	\$527.4

Figure 24. Ginnie Mae 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.

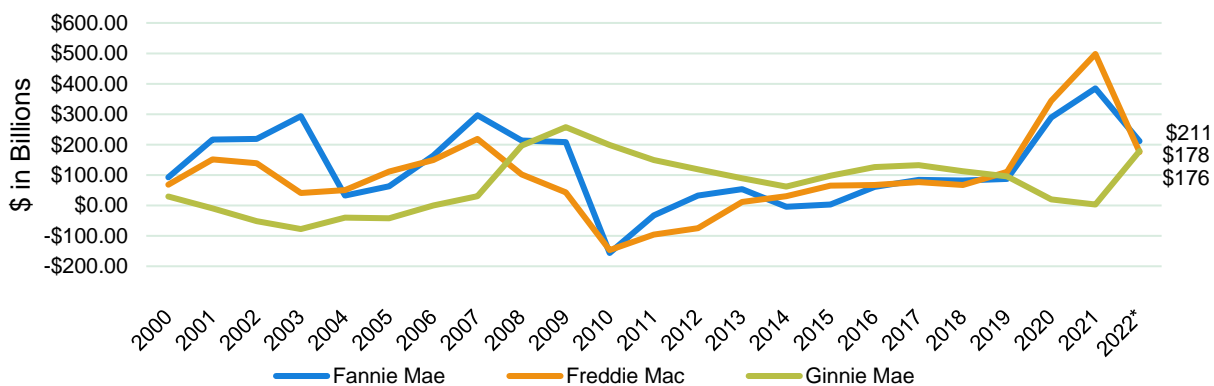
5.2 Net Issuance of Agency MBS

Agency net issuance in November was approximately \$22.1 billion, which represents a 20.5% MoM decrease in net issuance driven entirely by decreases in GSE net issuance. Ginnie Mae net issuance was \$18.3 billion in November, a 5.5% increase from October 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	\$193.8	\$161.4	\$355.2	\$163.4	\$518.5
2022 Annualized	\$211.4	\$176.0	\$387.4	\$178.2	\$565.7

Figure 25. Agency Net Issuance



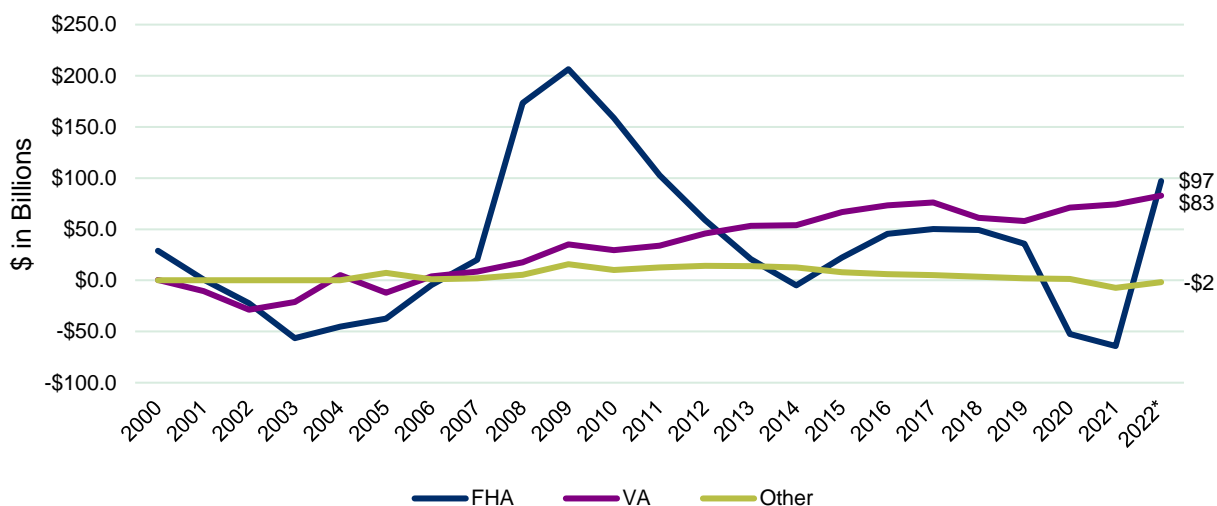
*2022 values have been annualized – the annualization methodology is not seasonally adjusted.

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)

<i>Issuance Year</i>	<i>FHA</i>	<i>VA</i>	<i>Other</i>	<i>Total</i>
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	\$89.1	\$75.9	-\$1.7	\$163.4
2022 Annualized	\$97.2	\$82.8	-\$1.8	\$178.2

Figure 26. 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)

Month	Agency Gross Issuance Amount (in \$ Billions)					Agency Net Issuance Amount (in \$ Billions)				
	Fannie Mae	Freddie Mac	Ginnie Mae	GSEs	Total	Fannie Mae	Freddie Mac	Ginnie Mae	GSEs	Total
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
Nov-22	\$25.7	\$22.7	\$33.6	\$48.4	\$82.0	\$0.3	\$3.5	\$18.3	\$3.8	\$22.1

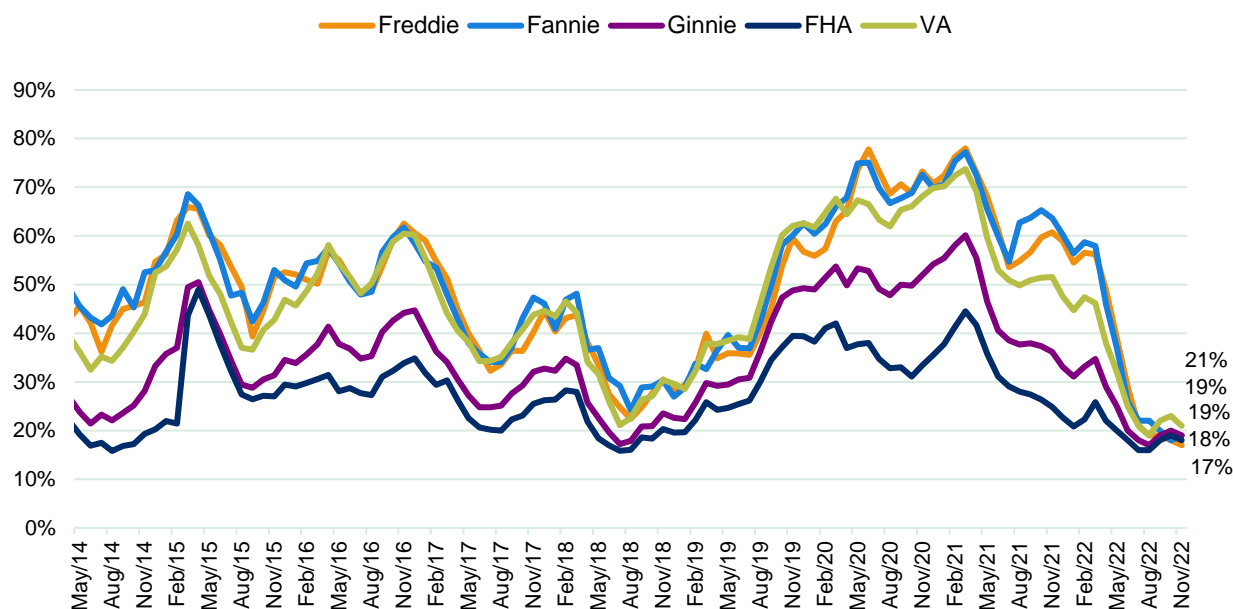
Source: Beginning May 2021, data for Gross and Net Issuance was sourced from Fannie Mae, Freddie Mac, and Ginnie Mae loan level disclosure files. Net issuance is defined here as the difference between prior period UPB and current period UPB. Data as of November 2022. Beginning with the October 2021 GMAR, the Fannie Mae and Freddie Mac net issuance data have been updated to reflect the current UPB of the portfolios. July 2021 through November 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 decreased for Ginnie Mae in November. In the conventional mortgage market space, Fannie Mae saw an increase of approximately 6% MoM while Freddie Mac's refinance share decreased 6% MoM. Ginnie Mae's MoM decrease was approximately 5%, with the greater drop taking place with VA lending which was down almost 9% in November MoM. FHA's refinance share decreased by approximately 5%.

- Freddie Mac's refinance percentage dropped to 17% in November, down from 18% in October.
- Fannie Mae's refinance percentage increased to 19% in November, up from 18% in October.
- Ginnie Mae's refinance percentage dropped to 19% in November, down from 20% in October.
- FHA's refinance percentage dropped to 18% in November, down from 19% in October.
- VA's refinance percentage dropped to 21% in November, down from 23% in October.

Figure 27. Percent Refinance at Issuance – Single-Family.



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

6 AGENCY SINGLE-FAMILY MBS OUTSTANDING

6.1 Outstanding Single-Family Agency MBS

As of November 2022, outstanding single-family MBS in the agency market totaled \$8.582 trillion: 41.6% Fannie Mae, 33.7% Freddie Mac, and 24.7% Ginnie Mae MBS. Over the past twelve months, Freddie Mac's, Fannie Mae's, and Ginnie Mae's total outstanding MBS increased by approximately 8.5%, 5.5% and 8.9%, respectively. Fannie Mae outstanding MBS remains larger than Freddie Mac's and Ginnie Mae's by approximately \$685 billion and \$1.5 trillion, respectively.

Ginnie Mae MBS collateral composition has changed dramatically over the past five years. In November 2017, 60.9% of Ginnie Mae outstanding collateral was FHA and 32.8% was VA. In November 2022, FHA collateral comprised 52.7% of Ginnie Mae MBS outstanding and VA collateral comprised 42.3% of Ginnie Mae MBS outstanding.

Figure 28. Outstanding Agency Mortgage-Backed Securities.

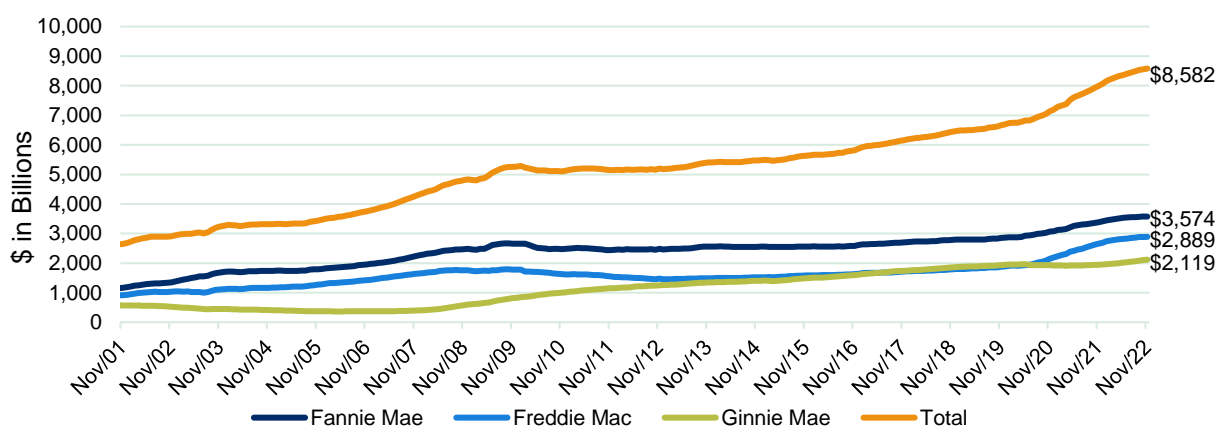
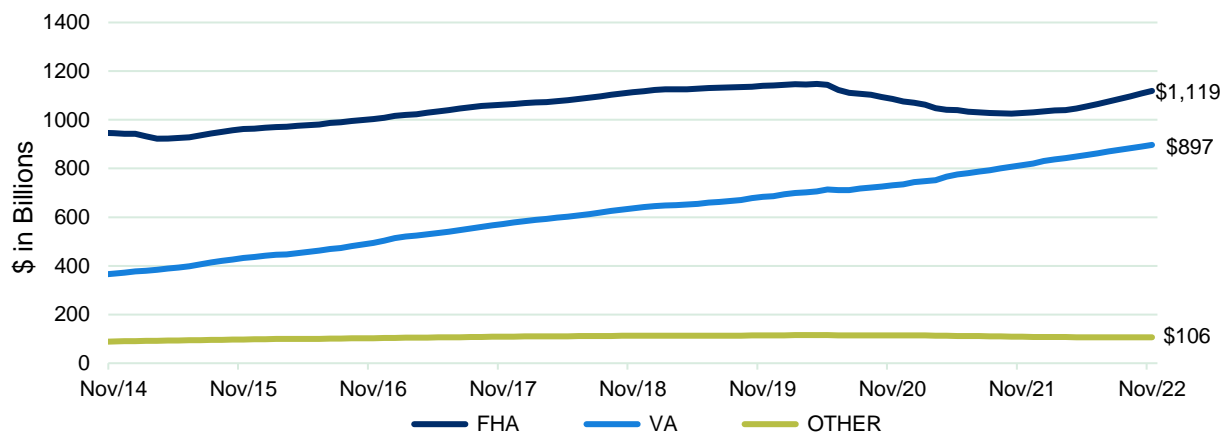


Figure 29. Composition of Outstanding Ginnie Mae Mortgage-Backed Securities.



Sources: Recursion. Note: Data as of November 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 30. First Lien Origination Volume

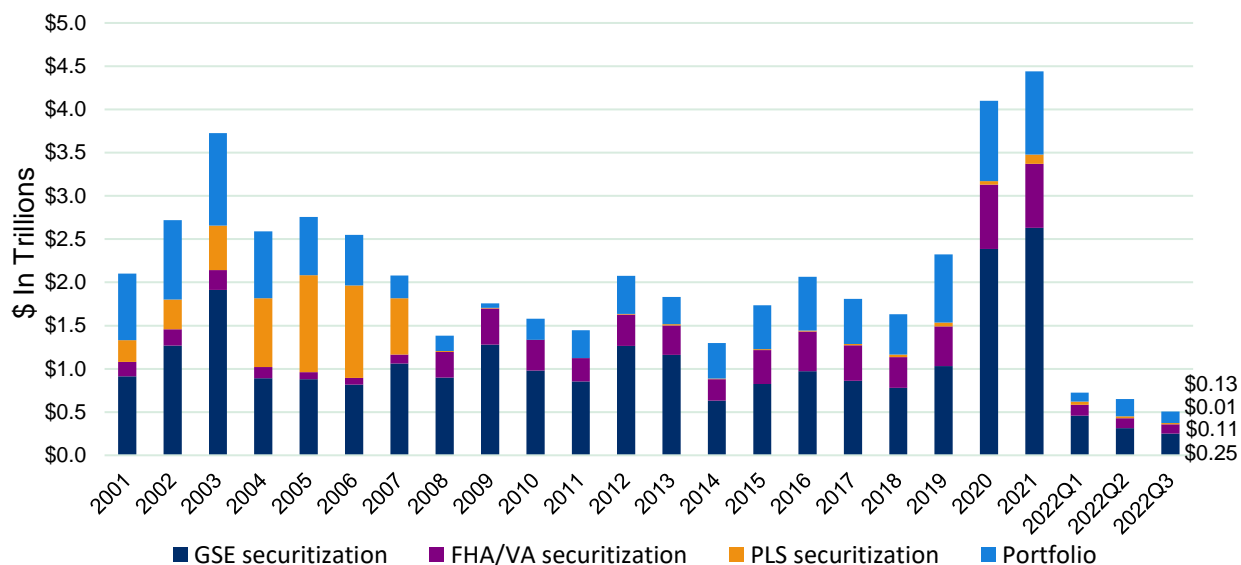
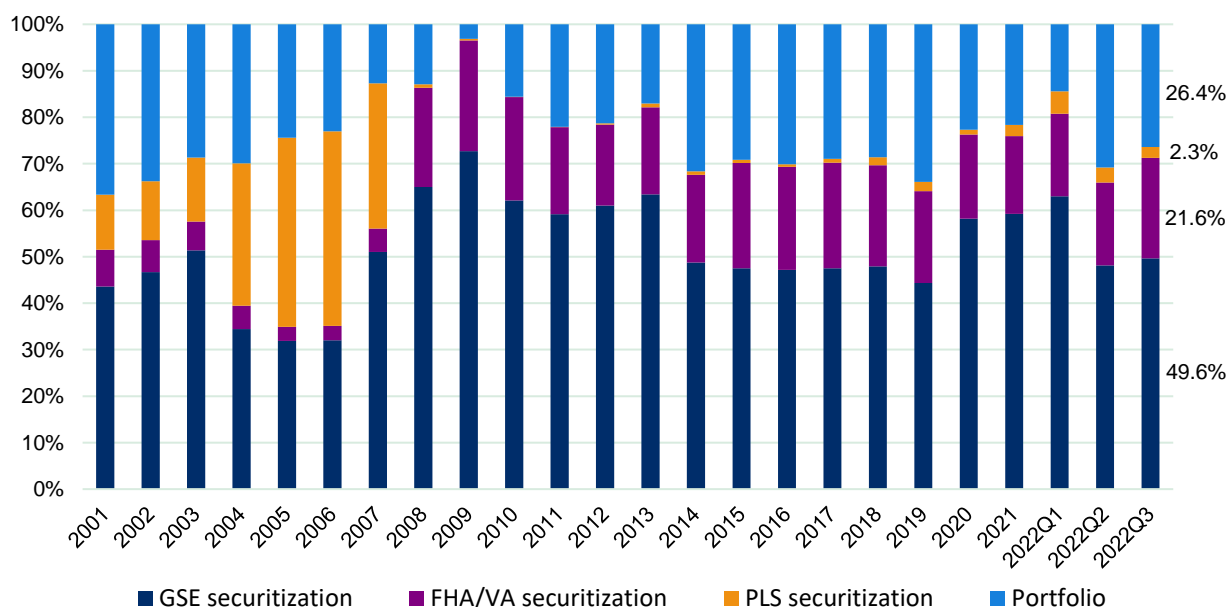


Figure 31. First Lien Origination Share



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 (18%). 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

National	Agency Issuance (past 1 year)				Agency Outstanding			
	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%	2,480,932	276.27	283.75	25%	10,622,771	203.97	211.00
AK	51%	8,427	330.70	295.47	47%	37,276	261.67	221.74
AL	42%	53,992	218.98	233.63	40%	234,508	156.29	177.70
AR	39%	28,976	187.30	216.05	39%	136,011	131.76	160.89
AZ	26%	74,944	306.82	312.55	24%	270,078	217.76	225.66
CA	21%	171,988	434.50	426.30	16%	676,713	326.58	321.24
CO	27%	56,428	390.86	373.44	23%	211,871	290.53	277.41
CT	28%	23,635	259.62	275.45	25%	104,995	201.94	209.92
DC	18%	1,978	497.20	427.95	13%	8,839	381.63	351.28
DE	33%	12,146	263.59	285.17	31%	51,240	203.67	211.38
FL	32%	217,523	285.21	287.11	31%	838,927	210.53	210.99
GA	35%	126,143	247.70	280.33	33%	492,405	178.75	206.56
HI	38%	7,978	610.43	487.14	32%	33,328	469.47	359.01
IA	26%	17,051	180.69	195.77	22%	81,814	133.62	148.88
ID	25%	14,640	327.23	315.35	23%	63,055	216.71	222.75
IL	25%	83,708	208.14	241.22	22%	362,646	159.65	179.75
IN	31%	62,907	186.87	205.32	30%	276,331	133.42	150.85
KS	30%	20,003	191.14	219.92	29%	95,574	139.58	164.06
KY	36%	37,188	194.83	211.20	34%	163,507	143.16	156.08
LA	44%	45,716	203.95	233.60	40%	198,792	157.54	177.86
MA	22%	27,802	368.41	362.44	16%	112,520	284.22	269.67
MD	38%	69,607	333.61	323.25	33%	289,408	265.03	250.22
ME	28%	8,543	239.99	263.09	25%	37,525	177.25	192.00
MI	22%	60,895	184.19	211.52	20%	272,751	133.42	157.20
MN	20%	32,633	244.18	269.83	18%	158,500	182.06	198.91
MO	31%	52,824	195.07	216.73	29%	242,441	141.63	162.31
MS	49%	26,842	198.55	213.56	47%	121,247	143.04	161.43
MT	24%	6,841	300.93	306.01	23%	32,129	208.33	216.51
NC	30%	98,555	244.08	277.25	28%	409,825	174.78	201.97
ND	30%	3,969	242.46	239.45	24%	16,950	193.30	185.11
NE	28%	12,771	213.96	217.29	26%	64,411	148.69	161.29
NH	24%	8,327	303.56	298.14	22%	37,974	225.94	215.30
NJ	25%	56,172	310.55	330.28	21%	229,306	239.81	255.17
NM	38%	19,626	235.90	246.35	37%	94,347	166.16	178.39
NV	32%	35,752	333.32	321.93	30%	131,298	247.04	235.29
NY	22%	57,197	300.19	339.81	20%	304,457	208.65	248.81
OH	30%	89,766	180.22	199.98	29%	419,219	129.87	149.40
OK	40%	38,213	198.51	218.24	41%	187,592	140.61	162.39
OR	21%	26,169	345.27	351.01	19%	109,575	253.54	253.84
PA	25%	74,141	199.71	243.85	25%	385,042	148.77	182.42
RI	35%	8,632	313.53	291.70	30%	35,244	233.65	213.60
SC	36%	60,554	245.81	256.00	34%	232,029	182.42	192.14
SD	31%	6,137	239.00	239.33	29%	29,094	172.74	178.14
TN	31%	64,242	251.99	273.56	31%	267,565	174.61	204.19
TX	30%	237,895	256.71	290.64	31%	1,077,553	181.13	212.16
UT	21%	24,188	365.60	367.29	18%	94,469	258.86	263.69
VA	40%	102,861	327.25	316.19	36%	442,592	256.66	250.87
VI	20%	144	375.43	412.29	23%	782	247.73	302.87
VT	20%	2,371	237.58	260.41	18%	11,998	181.26	180.97
WA	25%	55,753	390.12	390.35	21%	230,539	284.22	289.75
WI	20%	26,935	207.87	225.24	17%	122,630	156.49	163.90
WV	46%	13,212	193.07	194.82	43%	58,959	143.93	145.70
WY	36%	5,992	263.52	264.00	34%	24,890	206.23	202.22

Source: Recursion. Note: Outstanding balance is based on loan balance as of November 2022. Ginnie Mae issuance is based on the last 12 months, from October 2021 to November 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 November 2022, the weighted average coupon (WAC) on outstanding Ginnie Mae MBS increased slightly from 3.04% in October 2022 to 3.07% in November. With 30-year fixed mortgage rates for certain credit profiles at over 6.0% in November, 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 32. Outstanding Ginnie Mae MBS Balance, by Coupon.

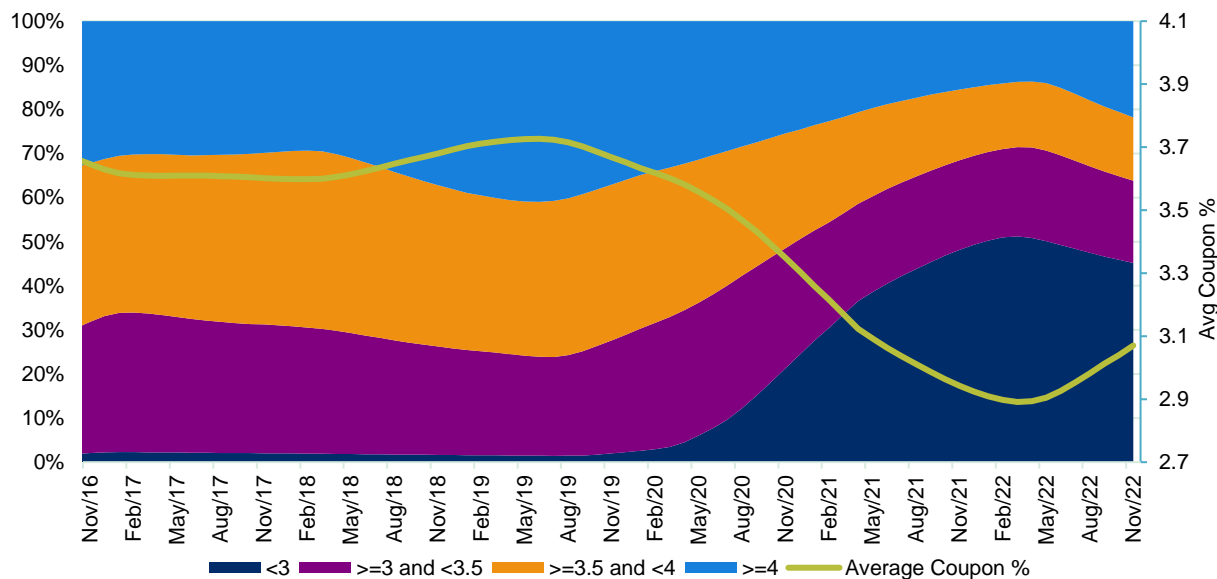
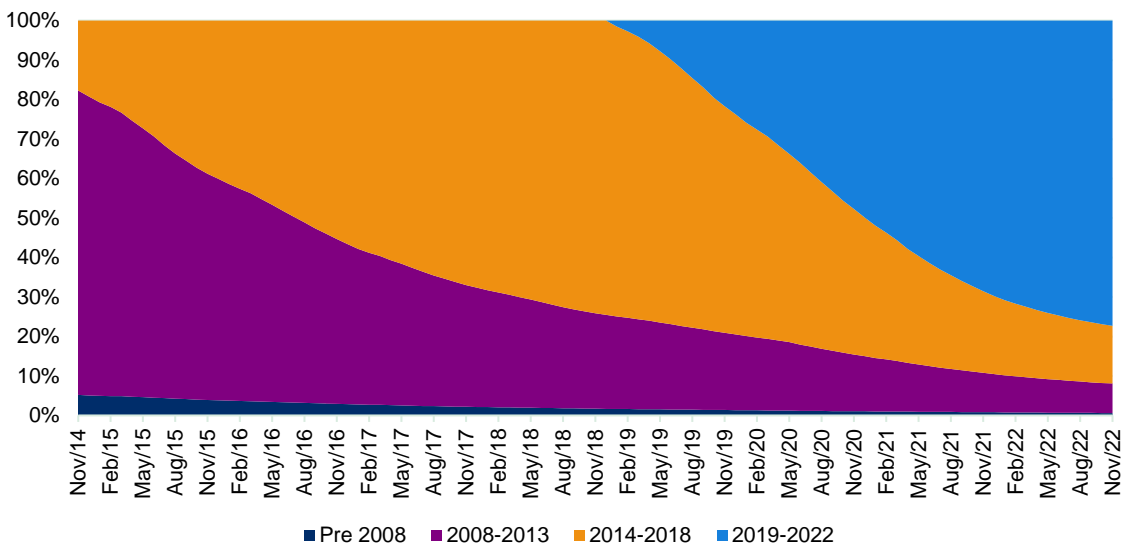


Figure 33. Outstanding Ginnie Mae MBS Balance, by Vintage.



Sources: Recursion. Note: November 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 November 2022, \$3.4 billion of Ginnie Mae MBS were securitized into Real Estate Mortgage Investment Conduits (REMICs) as underlying collateral, a 42% MoM decrease. Of that, approximately \$1.2 billion were multifamily MBS having coupons between 3.5% and 4.0%. \$2.1 billion were Single Family MBS with 84% of the single family MBS having coupons over 4.0%.

As of November, in 2022, approximately \$97.8 billion of Ginnie Mae single family and multifamily MBS were securitized into Ginnie Mae REMIC transactions. This represents a roughly 46.4% decrease over the same period in 2021 (\$182.6 billion).

Figure 34. Ginnie Mae Single Family and Multifamily MBS Securitized into REMICs

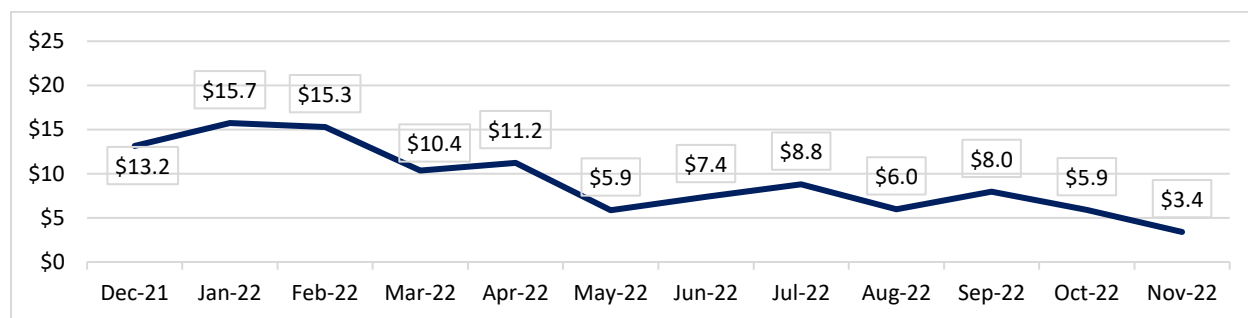


Table 7. November 2022 REMIC Collateral Coupon Distribution

Net Coupon (%)	Approx. Ginnie Mae MBS amount securitized into REMIC Deals (\$MM) ⁶	% Breakdown of REMIC Collateral by coupon ¹⁷
Multifamily		
3.51-4.00	1,153.9	100.0%
Subtotal	1,153.9	100%
Single-Family		
3.01-3.50	24.2	
3.51-4.00		1.0%
4.01-4.50	-	-
4.51-5.00	152.1	
5.01-5.50		7.0%
5.51-6.00	260.0	12.0%
6.01-6.50	689.0	33.0%
Subtotal	815.1	39.0%
Grand Total	155.0	7.0%

Source: Ginnie Mae Disclosure Files

⁶Totals may not sum due to rounding.

7.2 REMIC Market Snapshot

In November 2022, Ginnie Mae Single-Family REMIC collateral WAC increased MoM by 73 basis points which is the highest it has been in 2022. Freddie Mac and Fannie Mae Single-Family REMIC collateral WAC are also the highest they have been all of 2022 and increased MoM by 48 basis points and 35 basis points, respectively.

- In November 2022, Ginnie Mae REMIC issuance volume was \$5.9 billion, the seventh consecutive month of REMIC issuance volume below \$10.0 billion.
- Ginnie Mae guaranteed two HREMIC transactions in November 2022. This is the fourth month in 2022 in which Ginnie Mae guaranteed two HREMIC transactions. In 2021, there were seven months where Ginnie Mae guaranteed two HREMIC transactions.

Figure 35. REMIC Issuance by Agency

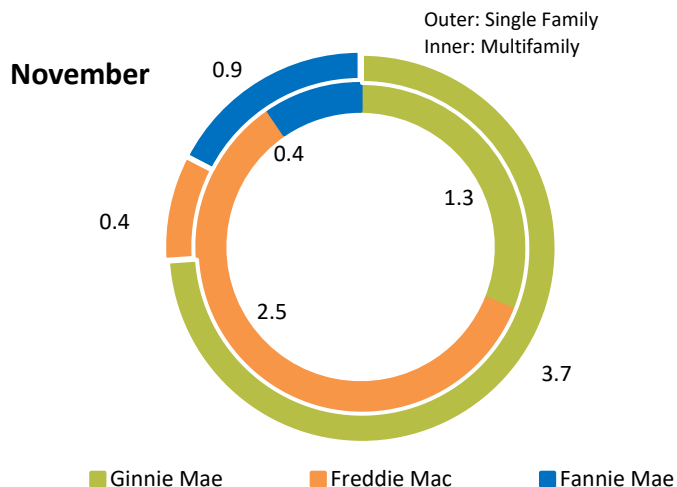


Table 8. Monthly REMIC Issuance by Agency

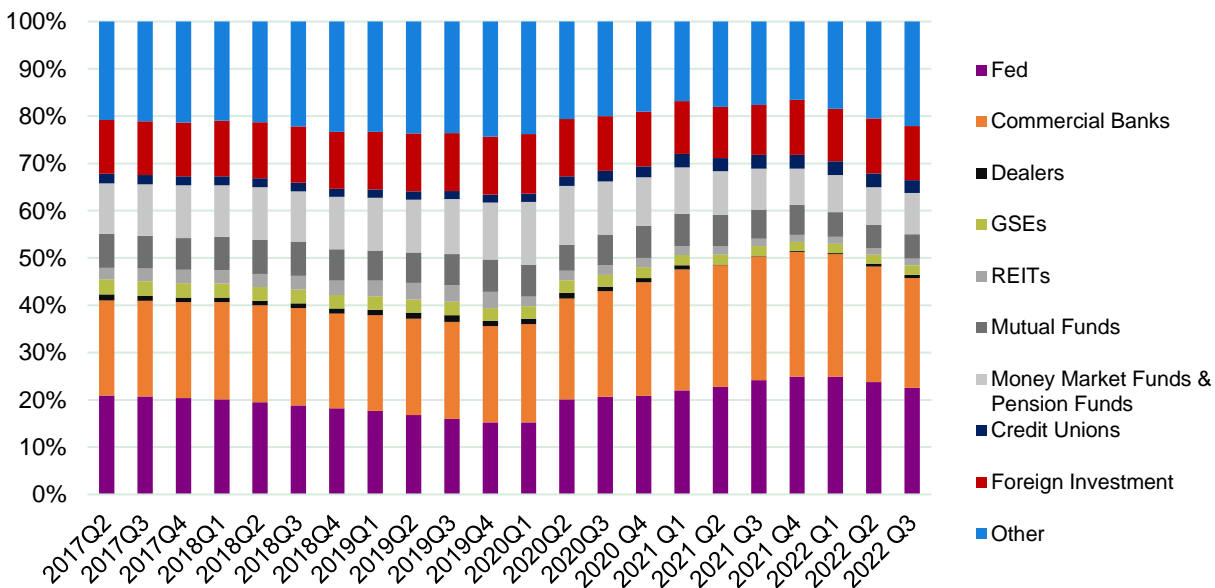
	<i>SF REMIC Issuance Volume (\$B)</i>	<i>% of SF REMIC Issuance Volume</i>	<i>Number of SF REMIC Trans- actions</i>	<i>MF REMIC Issuance Volume (\$B)</i>	<i>% of MF REMIC Issuance Volume</i>	<i>Number of MF REMIC Trans- actions</i>
Ginnie Mae	3.7	73.9	10	1.3	31.2	7
Freddie Mac	0.4	8.7	6	2.5	59.3	3
Fannie Mae	0.9	17.4	8	0.4	9.5	1
Total	\$5.0	100%	24	\$4.1	100%	11

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

8 MBS OWNERSHIP

As of Q3 2022, the largest holders of agency debt (agency MBS + agency notes and bonds) included commercial banks (23%), the Federal Reserve (23%), and foreign investors (11%). The Federal Reserve's share decreased slightly to 23% in the third quarter of 2022 from 24% in the second quarter. Along with Federal Reserves, commercial banks are also the largest holders of agency MBS. Out of their approximately \$2.8 trillion in holdings as of the end of September 2022, \$2.1 trillion was held by the top 25 domestic banks.

Figure 36. 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 Q3 2022.

8.1 Commercial Bank Holdings of Agency MBS

Table 8. Commercial Bank Holdings of Agency MBS

	Commercial Bank Holdings (\$Billions)								Week Ending			
	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	2-Nov	9-Nov	16-Nov	23-Nov
Largest 25 Domestic Banks	2,186.8	2,163.9	2,143.9	2,122.4	2,117.0	2,115.5	2,096.8	2,067.6	2,044.1	2,044.9	2,040.2	2,045.7
Small Domestic Banks	744.1	736.1	730.8	735.8	731.8	738.3	712.4	692.2	685.7	684.8	686.6	686.5
Foreign Related Banks	36.6	34.2	36.5	36.5	38.0	35.1	37.4	35.9	35.7	38.8	40.4	38.4
Total, Seasonally Adjusted	2,967.5	2,934.2	2,911.2	2,894.7	2,886.8	2,888.9	2,846.6	2,795.7	2,765.5	2,768.5	2,767.2	2,770.6

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

8.2 Bank and Thrift Residential MBS Holdings

In Q3 2022, MBS holdings at banks and thrifts continued to decrease. Like Q2 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 14.9% from Q3 2021 and 7.3% from Q2 2022. Out of the \$2.4 trillion in MBS holdings at banks and thrifts as of Q3 2022, \$1.5 trillion were GSE pass-throughs and \$352 billion were Ginnie Mae pass-throughs.

Table 9. Bank and Thrift Residential MBS Holdings

Year	All Banks & Thrifts (\$ in billions)						All MBS (\$ in billions)	
	Total	GSE PT	GNMA PT	Private MBS	Agency CMO	Private CMO	Banks	Thrifts
2001	\$730.84	\$270.59	\$109.53	\$37.62	\$236.91	\$76.18	\$606.91	\$203.37
2002	\$832.50	\$376.11	\$101.46	\$20.08	\$244.98	\$89.88	\$702.44	\$209.66
2003	\$899.89	\$461.72	\$75.11	\$19.40	\$236.81	\$106.86	\$775.66	\$206.45
2004	\$1,011.01	\$572.40	\$49.33	\$20.55	\$208.18	\$160.55	\$879.75	\$234.31
2005	\$1,033.77	\$566.81	\$35.92	\$29.09	\$190.70	\$211.25	\$897.06	\$242.69
2006	\$1,124.46	\$628.52	\$31.13	\$42.32	\$179.21	\$243.28	\$983.49	\$223.42
2007	\$1,149.10	\$559.75	\$31.58	\$26.26	\$174.27	\$357.24	\$971.42	\$264.59
2008	\$1,218.77	\$638.78	\$100.36	\$12.93	\$207.66	\$259.04	\$1,088.00	\$211.73
2009	\$1,275.52	\$629.19	\$155.00	\$7.53	\$271.17	\$212.64	\$1,161.67	\$184.07
2010	\$1,433.38	\$600.80	\$163.13	\$7.34	\$397.30	\$181.61	\$1,233.28	\$200.09
2011	\$1,566.88	\$627.37	\$214.81	\$3.28	\$478.82	\$167.70	\$1,359.24	\$207.64
2012	\$1,578.86	\$707.87	\$242.54	\$17.16	\$469.27	\$138.67	\$1,430.63	\$148.22
2013	\$1,506.60	\$705.97	\$231.93	\$26.11	\$432.60	\$114.15	\$1,363.65	\$142.94
2014	\$1,539.32	\$733.71	\$230.45	\$20.33	\$449.90	\$104.94	\$1,409.84	\$129.48
2015	\$1,643.56	\$823.10	\$292.30	\$11.14	\$445.39	\$71.63	\$1,512.67	\$130.89
2016	\$1,736.93	\$930.67	\$323.46	\$7.40	\$419.80	\$55.60	\$1,576.07	\$160.86
2017	\$1,844.15	\$1,010.83	\$367.70	\$4.63	\$413.97	\$47.01	\$1,672.93	\$171.22
1Q17	\$1,762.38	\$950.72	\$329.91	\$7.03	\$419.34	\$55.39	\$1,589.93	\$172.45
2Q17	\$1,798.66	\$985.12	\$335.47	\$6.38	\$417.89	\$53.79	\$1,635.11	\$163.55
3Q17	\$1,838.93	\$1,012.89	\$351.86	\$5.65	\$418.08	\$50.45	\$1,661.84	\$177.09
4Q17	\$1,844.15	\$1,010.83	\$367.70	\$4.63	\$413.97	\$47.01	\$1,672.93	\$171.22
1Q18	\$1,809.98	\$991.57	\$360.71	\$3.92	\$412.41	\$41.37	\$1,635.52	\$174.46
2Q18	\$1,806.58	\$976.92	\$368.88	\$7.45	\$414.41	\$38.92	\$1,631.65	\$174.93
3Q18	\$1,794.39	\$966.52	\$373.21	\$2.42	\$416.20	\$36.04	\$1,618.29	\$176.10
2018	\$1,814.97	\$980.56	\$380.43	\$2.69	\$416.59	\$34.69	\$1,634.99	\$179.98
1Q19	\$1,844.99	\$1,001.61	\$383.49	\$3.06	\$422.18	\$34.65	\$1,673.40	\$171.59
2Q19	\$1,907.13	\$1,037.93	\$407.97	\$2.90	\$421.56	\$36.76	\$1,727.65	\$179.47
3Q19	\$1,975.78	\$1,079.82	\$427.10	\$4.74	\$428.69	\$35.44	\$1,786.74	\$189.04
2019	\$1,985.38	\$1,089.41	\$426.85	\$4.62	\$428.99	\$35.52	\$1,796.29	\$189.09
1Q20	\$2,107.66	\$1,173.36	\$448.34	\$4.65	\$443.73	\$37.57	\$1,907.02	\$200.64
2Q20	\$2,195.19	\$1,228.87	\$441.06	\$5.00	\$478.11	\$42.14	\$1,946.36	\$248.83
3Q20	\$2,310.42	\$1,349.48	\$415.24	\$4.43	\$499.50	\$41.78	\$2,040.61	\$269.81
4Q20	\$2,520.90	\$1,537.54	\$390.66	\$3.94	\$548.65	\$40.10	\$2,210.22	\$310.68
1Q21	\$2,690.92	\$1,713.78	\$374.63	\$4.88	\$555.35	\$42.28	\$2,350.94	\$339.98
2Q21	\$2,781.91	\$1,825.80	\$352.77	\$4.77	\$555.45	\$43.12	\$2,431.76	\$350.15
3Q21	\$2,858.59	\$1,886.78	\$353.12	\$4.24	\$565.51	\$48.95	\$2,487.32	\$371.27
4Q21	\$2,906.04	\$1,915.48	\$352.71	\$4.45	\$577.98	\$55.42	\$2,529.78	\$376.26
1Q22	\$2,799.22	\$1,817.72	\$368.43	\$4.04	\$548.60	\$60.43	\$2,476.12	\$323.10
2Q22	\$2,623.79	\$1,665.94	\$369.20	\$3.81	\$523.01	\$61.83	\$2,321.17	\$302.62
3Q22	\$2,431.57	\$1,520.24	\$352.02	\$3.29	\$496.72	\$59.30	\$2,156.16	\$275.41
Change:								
2Q22-3Q22	-7.3%	-8.7%	-4.7%	-13.6%	-5.0%	-4.1%	-7.1%	-9.0%
3Q21-3Q22	-14.9%	-19.4%	-0.3%	-22.3%	-12.2%	21.1%	-13.3%	-25.8%

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

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

	<i>Institution</i>	<i>Total</i>	<i>GSE PT</i>	<i>GNMA PT</i>	<i>Agency CMO</i>	<i>Non-Agency</i>	<i>Share</i>
1	BANK OF AMERICA CORPORATION	\$448,327.00	\$376,124.00	\$65,016.00	\$7,038.00	\$149.00	18.4%
2	WELLS FARGO & COMPANY	\$230,903.00	\$161,579.00	\$66,412.00	\$2,847.00	\$65.00	9.5%
3	CHARLES SCHWAB	\$173,008.00	\$97,210.00	\$6,137.00	\$69,661.00	\$0.00	7.1%
4	JPMORGAN CHASE & CO.	\$146,574.00	\$70,263.00	\$61,958.00	\$91.00	\$14,262.00	6.0%
5	Truist Bank	\$108,697.00	\$53,669.00	\$12,382.00	\$39,508.00	\$3,138.00	4.5%
6	U.S. BANCORP	\$103,431.40	\$67,470.00	\$22,443.20	\$13,518.10	\$0.10	4.3%
7	CITIGROUP INC.	\$83,110.00	\$73,174.00	\$6,488.00	\$2,530.00	\$918.00	3.4%
8	PNC Bank, National Association	\$68,253.30	\$56,515.30	\$4,389.40	\$6,219.70	\$1,129.00	2.8%
9	Silicon Valley Bank	\$65,587.00	\$48,005.00	\$7,860.00	\$9,722.00	\$0.00	2.7%
10	CAPITAL ONE FINANCIAL CORPORATION	\$61,577.50	\$29,729.40	\$14,004.70	\$17,478.10	\$365.40	2.5%
11	MORGAN STANLEY	\$49,019.00	\$34,203.00	\$7,652.00	\$7,164.00	\$0.00	2.0%
12	BANK OF NEW YORK MELLON CORP	\$41,178.00	\$30,530.00	\$1,302.00	\$7,203.00	\$2,143.00	1.7%
13	USAA Federal Savings Bank	\$40,447.00	\$34,160.00	\$2,027.00	\$4,260.00	\$0.00	1.7%
14	State Street Bank and Trust Company	\$36,143.50	\$14,552.00	\$5,553.00	\$14,349.50	\$1,689.00	1.5%
15	TD Bank USA/TD Bank NA	\$29,579.30	\$947.80	\$81.70	\$28,508.70	\$41.00	1.2%
16	The Huntington National Bank	\$28,292.80	\$11,753.20	\$9,272.30	\$7,125.50	\$141.80	1.2%
17	KeyBank National Association	\$24,956.00	\$3,940.80	\$211.20	\$20,804.00	\$0.00	1.0%
18	Citizens Bank, National Association	\$22,339.10	\$12,379.30	\$4,908.60	\$5,051.20	\$0.00	0.9%
19	HSBC Bank USA, National Association	\$22,123.40	\$6,672.60	\$9,532.50	\$5,917.30	\$1.00	0.9%
20	Ally Bank	\$20,683.00	\$12,868.00	\$1,967.00	\$1,707.00	\$4,141.00	0.9%
	Total Top 20	\$1,804,229.3	\$1,195,745.4	\$309,597.6	\$270,702.1	\$28,183.3	74.2%

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

8.3 Foreign Ownership of MBS

For the month of October 2022, foreign ownership of MBS represents \$1.15 trillion in agency MBS, up approximately \$42 billion from September 2022. Total foreign ownership includes \$548 billion held by foreign private institutions and \$605 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 13.52% in October of 2022.

Figure 37. Foreign Share of Agency MBS Market

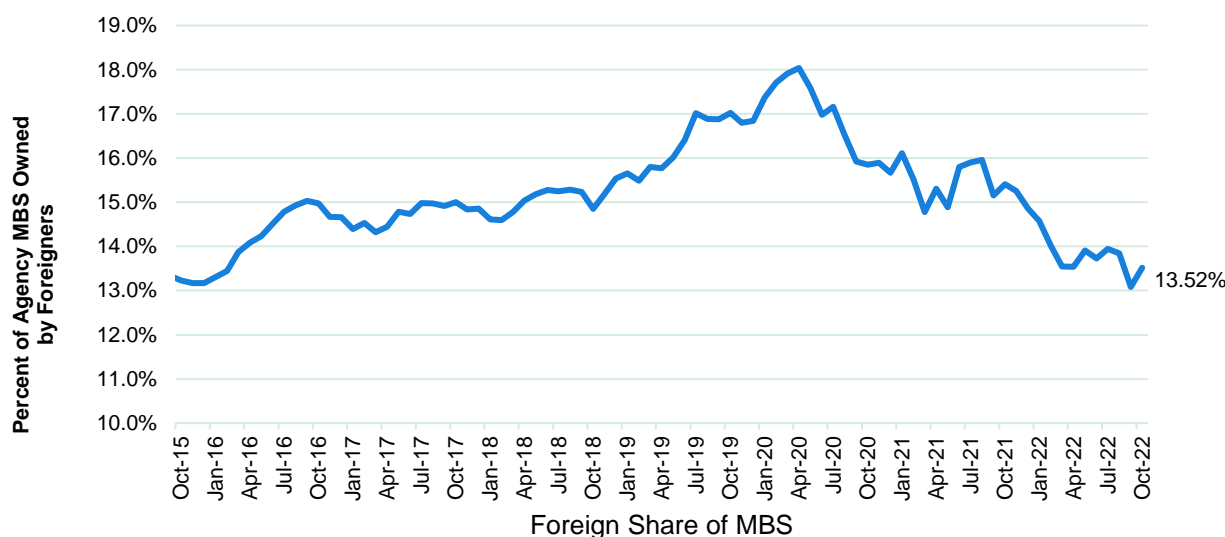
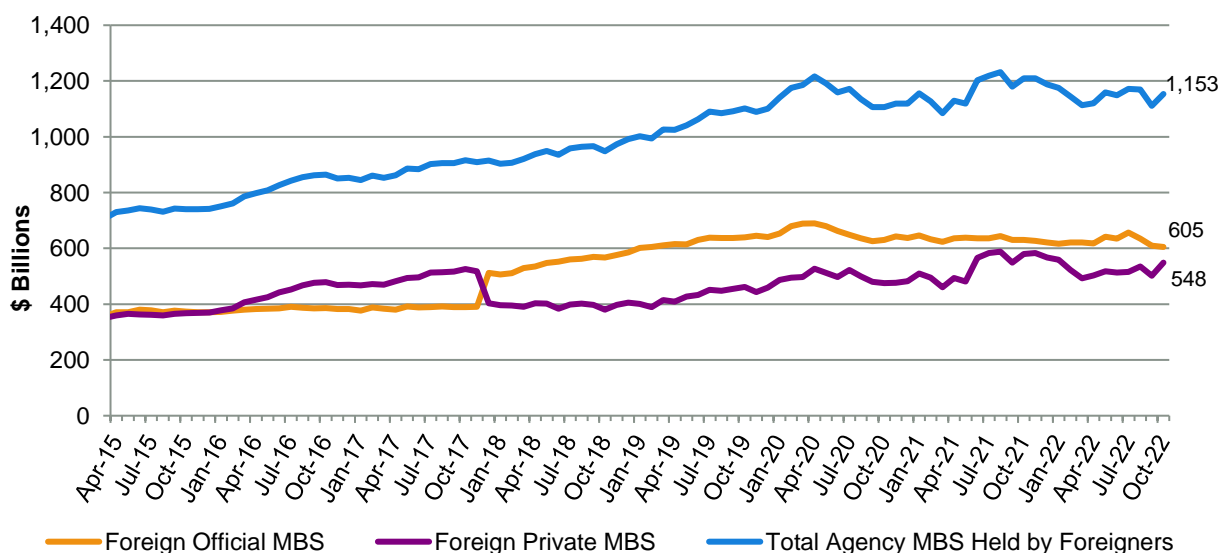


Figure 38. Monthly Foreign MBS Holdings



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

Outside of the US, China, Japan, and Taiwan are the nations with the largest holdings agency MBS. As of September 2022, these three own 59% 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's holdings has increased. Japan's holdings has decreased 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)			
	12/1/2021	3/1/2022	6/1/2022	9/1/2022	Q4 2021	Q1 2022	Q2 2022	Q3 2022
China	202,659	219,553	244,266	241,462	-12,397	16,894	24,713	-2,804
Japan	301,979	259,844	252,455	232,764	-8,293	-42,135	-7,389	-19,691
Taiwan	244,375	233,340	222,670	209,453	-2,512	-11,035	-10,670	-13,217
Canada	77,979	73,475	75,998	89,083	2,305	-4,504	2,523	13,085
United Kingdom	72,486	47,582	65,393	55,677	29,251	-24,904	17,811	-9,716
Luxembourg	34,288	33,130	42,207	38,341	1,173	-1,158	9,077	-3,866
South Korea	42,051	40,362	37,934	35,643	-970	-1,689	-2,428	-2,291
Cayman Islands	35,004	31,795	33,984	34,996	-599	-3,209	2,189	1,012
Switzerland	19,770	17,261	19,634	20,126	-7,000	-2,509	2,373	492
Bermuda	23,209	21,159	19,464	18,681	-1,070	-2,050	-1,695	-783
Other	188,982	184,971	192,728	185,849	7,907	-4,011	7,757	-6,879
Total	1,242,782	1,162,472	1,206,733	1,162,075	7,795	-80,310	44,261	-44,658

Table 12. Agency MBS

Country	Level of Holdings (\$ Millions)		
	6/1/2021	6/1/2022	YoY Change in Holdings (\$ Millions)
China	217,858	244,266	26,408
Japan	311,576	252,455	-59,121
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
Switzerland	23,813	19,634	-4,179
Bermuda	24,178	19,464	-4,714
Other	194,327	192,728	-1,599
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 Q3 2022. Agency MBS as of June 2022. Revised to include top 10 holders of agency debt listed as of September 2022.

9 FIXED INCOME LIQUIDITY INDICATORS

The agency MBS average daily trading volume as of November 2022 was \$245 billion for 2022 YTD, which is down from \$281 billion for calendar year 2021. Compared to October 2022, agency MBS average daily trading volume saw a 4.8% decrease 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%, slightly higher than the agency MBS turnover. Turnover for Corporates remains minimal relative to agency MBS or Treasury turnover.

Figure 39. Average Daily Trading Volume by Sector

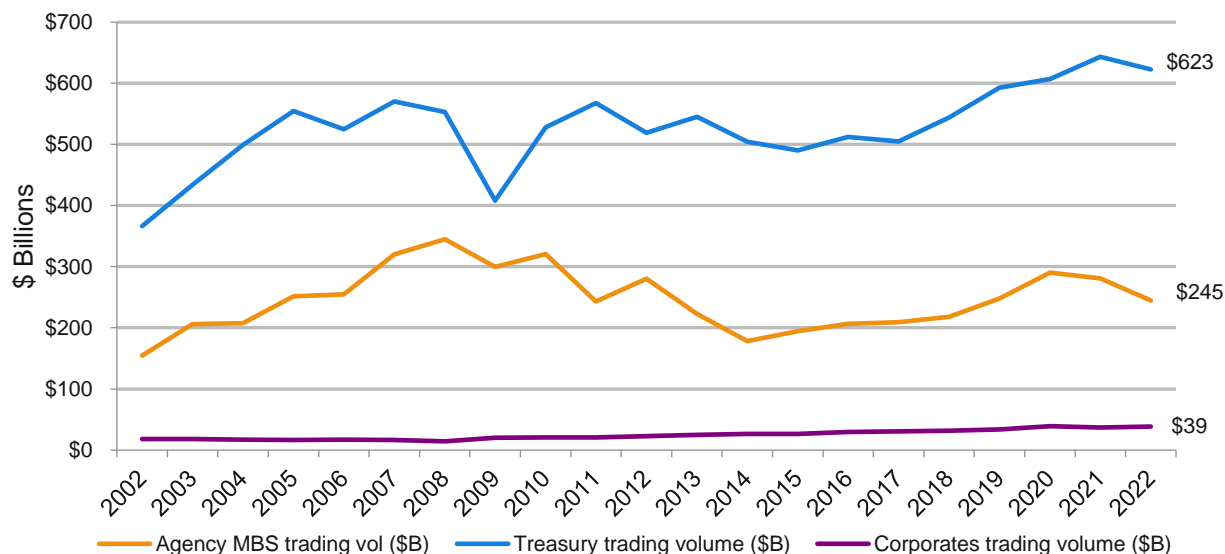
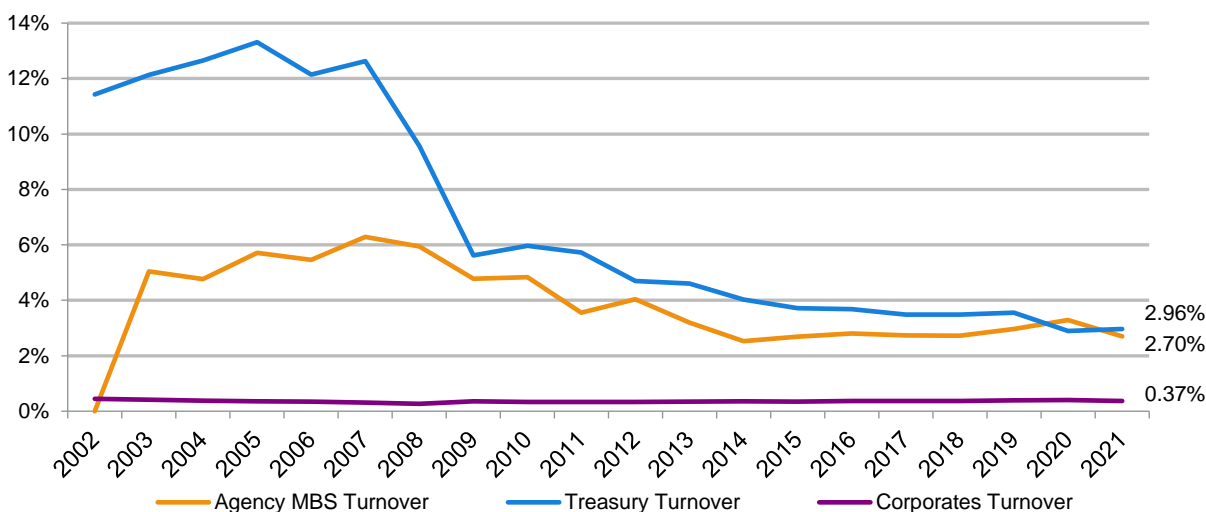


Figure 40. Average Daily Turnover by Sector



Source: SIFMA. Note: Data as of November 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 FICO's, DTIs, and LTVs between the agencies and between FHA, VA, and other Ginnie Mae loan sources as of the end of November 2022. The distribution statistics capture some key differences in the populations served by the agencies.

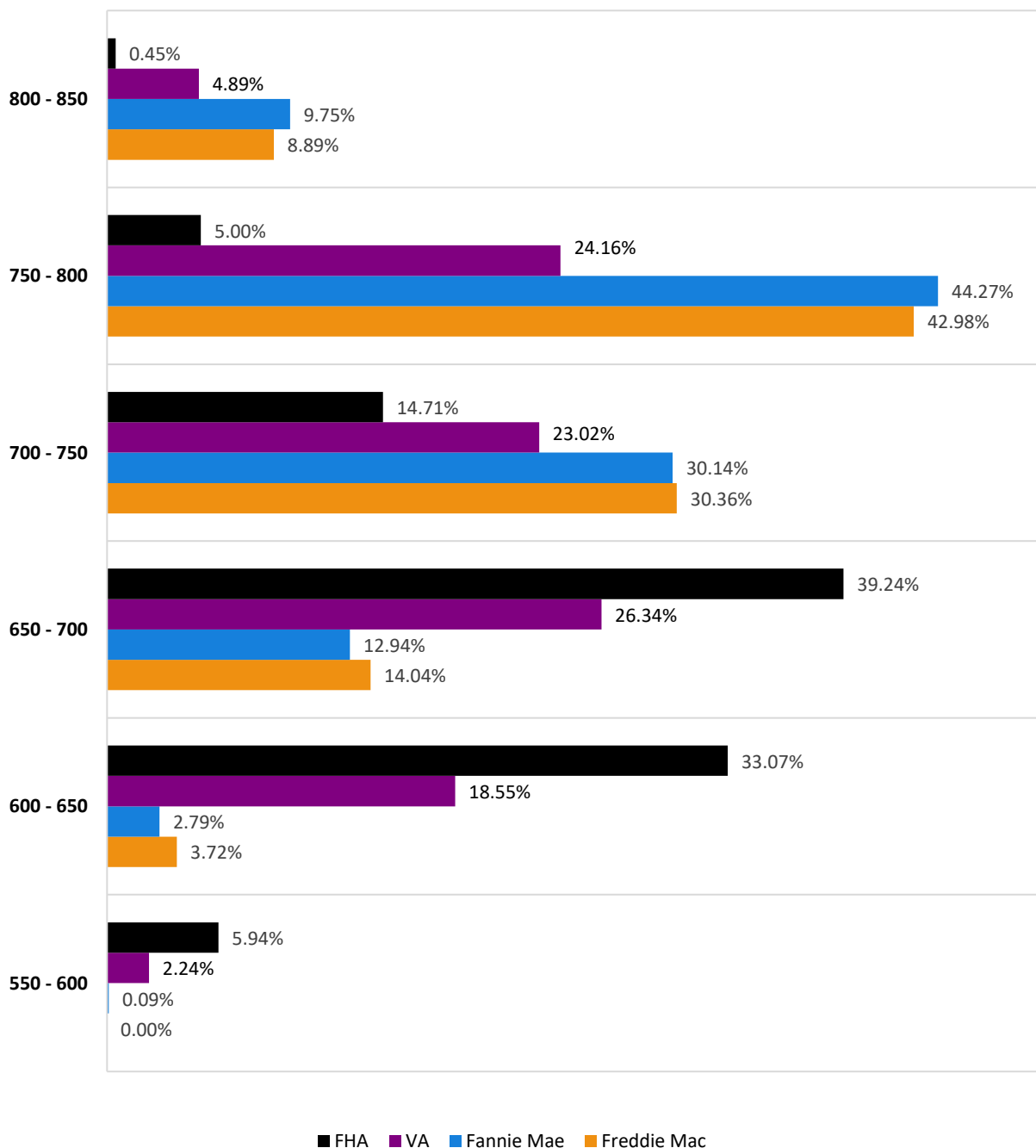
10.1 Credit Scores

Table 13. Share of Loans by FICO Score

Purchase FICO							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	205,546	646	684	737	776	797	728
Fannie	64,820	693	726	760	786	801	753
Freddie	59,265	696	727	760	786	801	753
Ginnie	81,461	625	648	681	729	773	690
Refi FICO							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	59,917	623	652	698	748	784	699
Fannie	19,617	663	699	739	774	796	733
Freddie	16,187	646	677	715	758	788	717
Ginnie	24,113	597	625	654	690	731	659
All FICO							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	265,463	639	675	728	772	795	721
Fannie	84,437	685	719	756	784	800	748
Freddie	75,452	680	714	753	783	799	745
Ginnie	105,574	619	643	674	720	767	683
Purchase FICO: Ginnie Mae Breakdown By Source							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	81,461	625	648	681	729	773	690
FHA	48,923	621	642	667	699	736	673
VA	28,360	636	669	721	770	794	718
Other	4,178	637	660	695	732	762	697
Refi FICO: Ginnie Mae Breakdown By Source							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	24,113	597	625	654	690	731	659
FHA	14,667	589	619	645	673	701	645
VA	9,422	613	640	675	719	758	680
Other	24	645	660	702	750	768	696
All FICO: Ginnie Mae Breakdown By Source							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	105,574	619	643	674	720	767	683
FHA	63,590	611	636	662	693	730	666
VA	37,782	629	659	707	760	790	708
Other	4,202	637	660	695	732	763	697

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

Figure 41. FICO Distributions by Agency



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

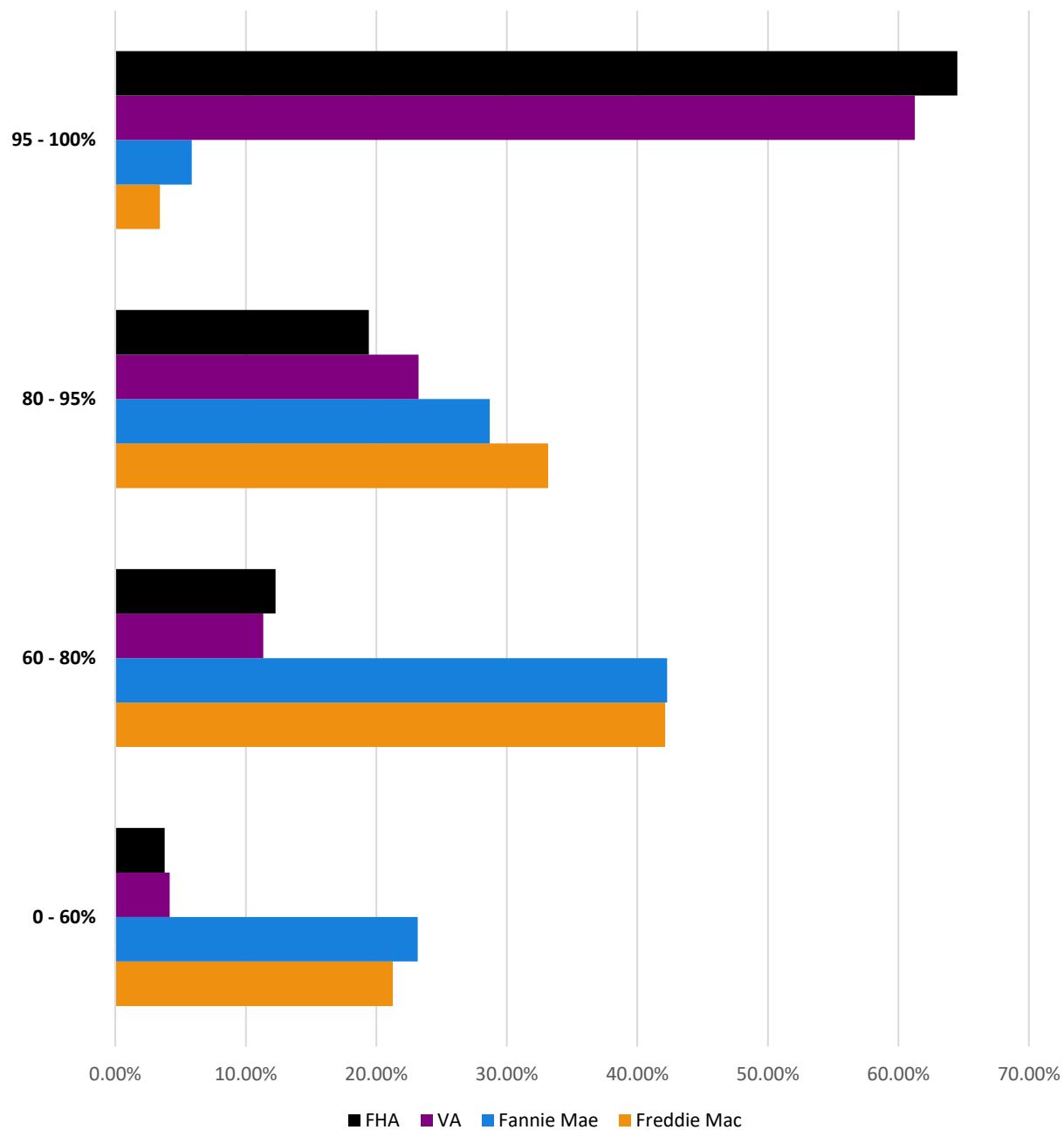
10.2 Loan-to-Value (LTV)

Table 14. Share of Loans by LTV

<i>Purchase LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	205,777	65	80	94	98	100	87
Fannie	64,877	55	75	80	95	95	81
Freddie	59,293	55	75	80	95	95	79
Ginnie	81,607	90	98	98	100	100	96
<i>Refi LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	59,922	39	55	70	80	86	66
Fannie	19,617	32	46	60	70	79	58
Freddie	16,187	34	48	62	74	80	60
Ginnie	24,118	57	70	80	84	91	77
<i>All LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	265,699	54	74	85	97	99	82
Fannie	84,494	45	64	80	90	95	76
Freddie	75,480	47	66	80	90	95	75
Ginnie	105,725	75	88	98	99	100	92
<i>Purchase LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	81,607	90	98	98	100	100	96
FHA	49,017	92	97	98	98	98	96
VA	28,393	85	100	100	100	102	96
Other	4,197	93	99	101	101	101	98
<i>Refi LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	24,118	57	70	80	84	91	77
FHA	14,668	54	67	77	81	81	72
VA	9,426	64	77	89	90	100	84
Other	24	50	73	88	97	99	81
<i>All LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	105,725	75	88	98	99	100	92
FHA	63,685	73	81	98	98	98	91
VA	37,819	76	90	100	100	102	93
Other	4,221	92	99	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 42. Loan-to Value by Agency



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

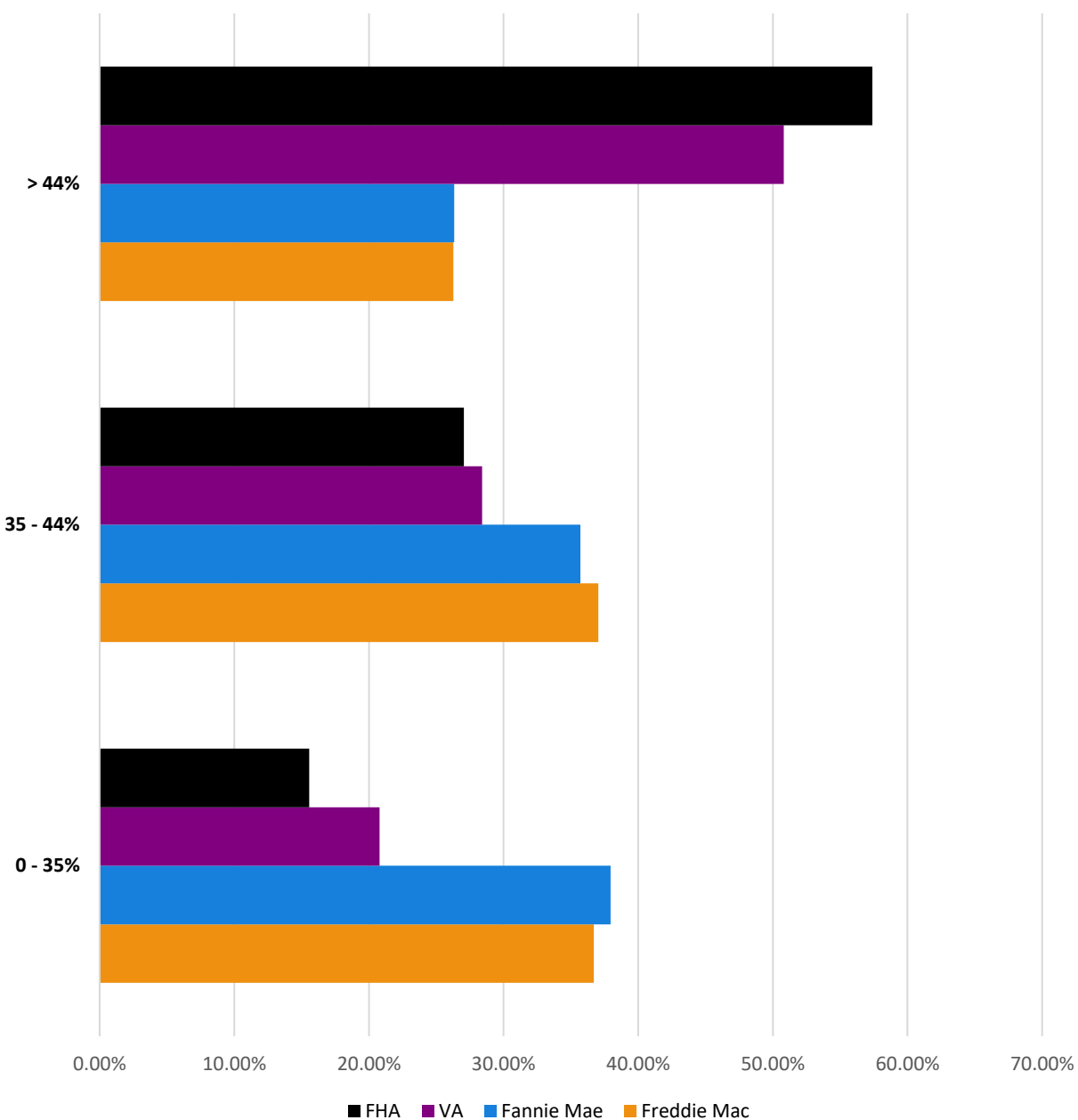
10.3 Debt-to-Income (DTI)

Table 15. Share of Loans by DTI

<i>Purchase DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	205,394	26	34	42	48	51	40
Fannie	64,877	24	31	39	45	49	38
Freddie	59,293	24	31	39	45	48	38
Ginnie	81,224	32	39	45	51	55	44
<i>Refi DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	59,869	25	33	40	46	50	39
Fannie	19,617	23	30	38	44	47	36
Freddie	16,187	25	32	40	45	48	38
Ginnie	24,065	29	36	43	50	54	42
<i>All DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	265,263	26	34	41	47	51	40
Fannie	84,494	24	31	39	45	48	37
Freddie	75,480	24	32	39	45	48	38
Ginnie	105,289	31	38	45	51	55	44
<i>Purchase DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	81,224	32	39	45	51	55	44
FHA	48,992	34	40	47	52	55	45
VA	28,040	30	38	45	51	56	44
Other	4,192	27	31	36	40	42	35
<i>Refi DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	24,065	29	36	43	50	54	42
FHA	14,660	29	36	44	50	55	43
VA	9,381	28	35	42	49	54	42
Other	24	26	34	38	40	41	35
<i>All DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	105,289	31	38	45	51	55	44
FHA	63,652	32	39	46	52	55	45
VA	37,421	30	37	44	51	56	43
Other	4,216	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 43. 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 September 2020 – November 2020 and September 2022 – November 2022. The share of borrowers with DTIs below 35% decreased by approximately 24% over the same period. From the period between September 2020 – November 2020 to the period between September 2022 – November 2022, the share of high-LTV loans increased in the Ginnie Mae guarantee book by approximately 12% and in the GSE portfolios by approximately 154%. 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 67.77% of its issuances between September 2022 and November 2022 having LTVs of 95 or above, compared to 21.89% for the GSEs.

Table 16. Share of Loans with LTV > 95

	Ginnie Mae	GSE	All
Sep 2020 - Nov 2020	60.27%	8.62%	19.84%
Sep 2022 - Nov 2022	67.77%	21.89%	38.84%

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

FICO						
DTI	<650	650-700	700-750	≥750	NA	All
<35	1.95%	4.67%	6.22%	10.60%	0.13%	23.57%
35-45	4.16%	9.31%	10.21%	10.85%	0.04%	34.57%
≥45	3.74%	8.09%	7.14%	5.79%	0.02%	24.79%
NA	1.58%	2.82%	2.75%	3.19%	6.73%	17.07%
All	11.44%	24.89%	26.32%	30.43%	6.92%	100.00%

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

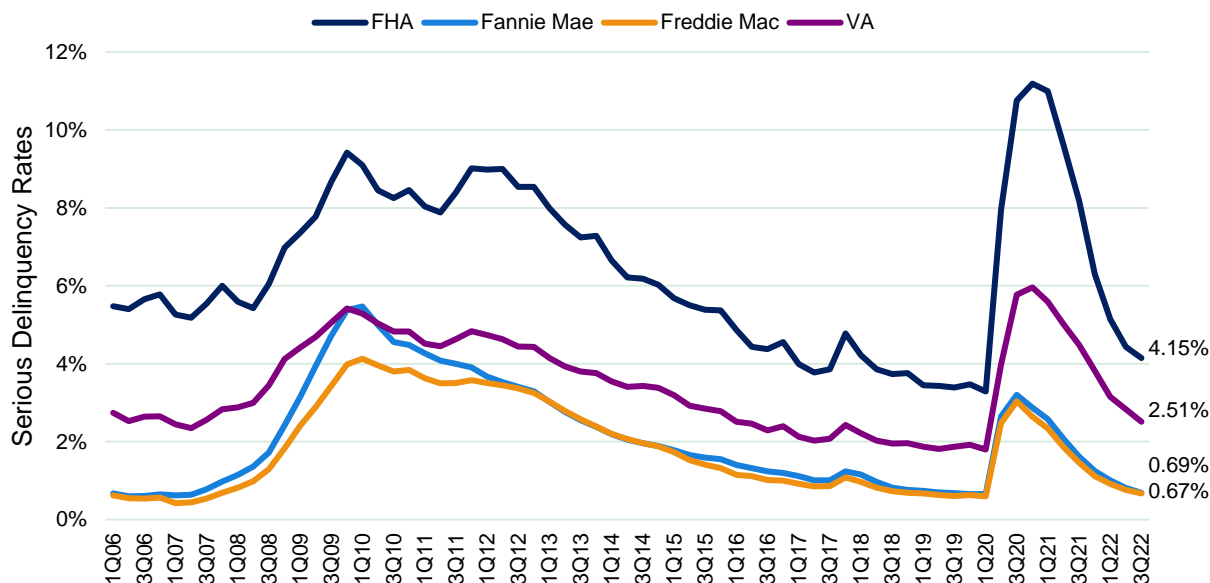
FICO						
DTI	<650	650-700	700-750	≥750	NA	All
<35	2.21%	3.49%	4.73%	7.38%	0.03%	17.84%
35-45	5.95%	9.19%	10.44%	11.17%	0.03%	36.79%
≥45	8.21%	13.54%	12.03%	10.38%	0.06%	44.23%
NA	0.28%	0.22%	0.15%	0.17%	0.33%	1.14%
All	16.65%	26.44%	27.35%	29.10%	0.46%	100.00%

Sources: Recursion and Ginnie Mae. Data as of November 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 44. 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 52.4% in November 2022, up slightly from 51.9% in November 2021. Ginnie Mae and Freddie Mac's first-time homebuyer shares, 68.2% and 40.1% respectively in November, have remained relatively flat YoY. Fannie Mae's first-time homebuyer share has declined 6.7% YoY. Table 20 shows that based on mortgages originated in November 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 45. First-Time Homebuyer Share: Purchase Only Loans

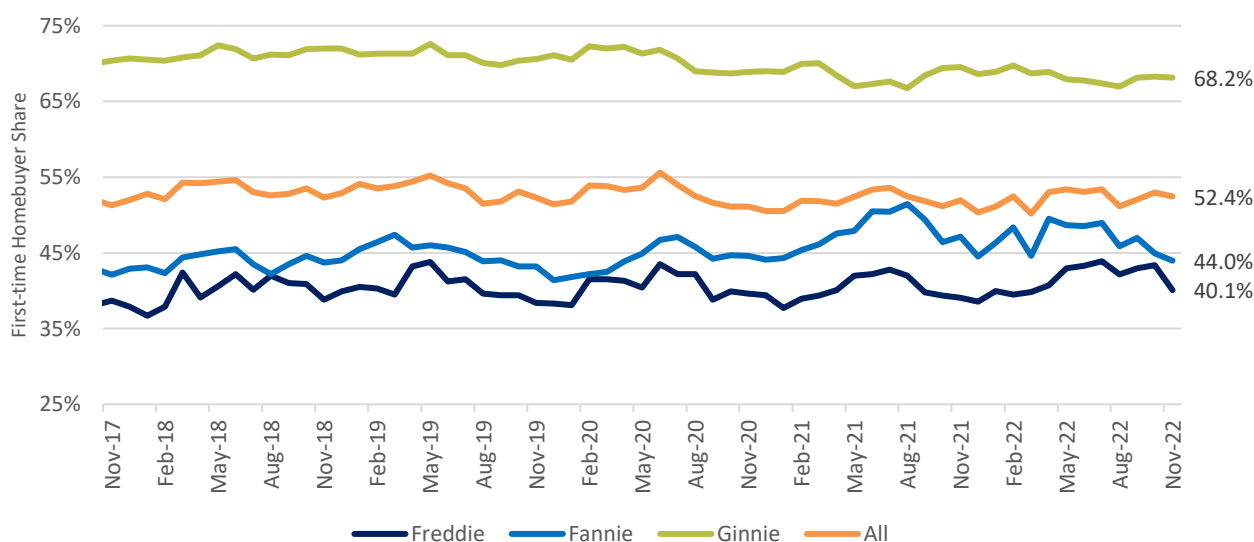


Table 19. Agency First-Time Homebuyer Share Summary

	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, 76.4% of FHA loans, 51.6% of VA loans, and 83.3% of other loans provided financing for first-time home buyers in November 2022. While FHA loans remained stable, VA decreased MoM and other increased MoM. Table 21 shows that based on mortgages originated in November, the credit profile of the average VA first-time homebuyer differed from 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 similar to their repeat buyers, with only 4.9% smaller loans and 2.4% higher LTVs. Because FHA provides one of few credit options for borrowers with lower credit scores, repeat borrowers with weaker credit profiles are often limited to FHA financing; 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.

Figure 46. First-time Homebuyer Share: Ginnie Mae Breakdown

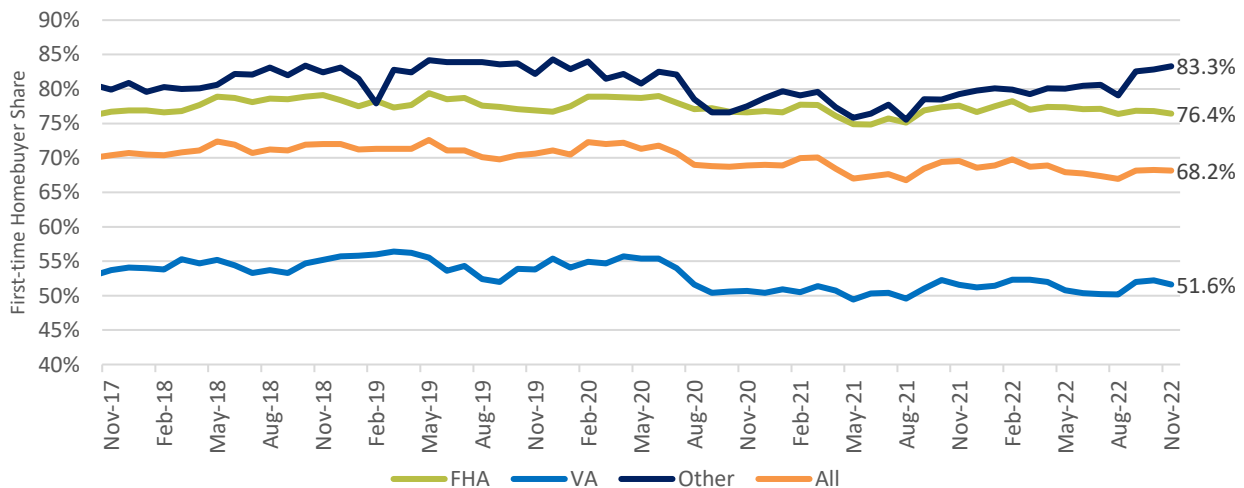


Table 21. Ginnie Mae First-Time Homebuyer Share Breakdown Summary

	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 November was 725, which represents a 14 point decrease since the start of 2022, a decline of 3 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 687 in November 2021 to 671 in November 2022, a 16 point drop. As of November 2022, average FICO for refinances have dropped for Fannie Mae and Freddie Mac borrowers YoY 24 and 36 points respectively.

Figure 47. FICO Scores for All Loans

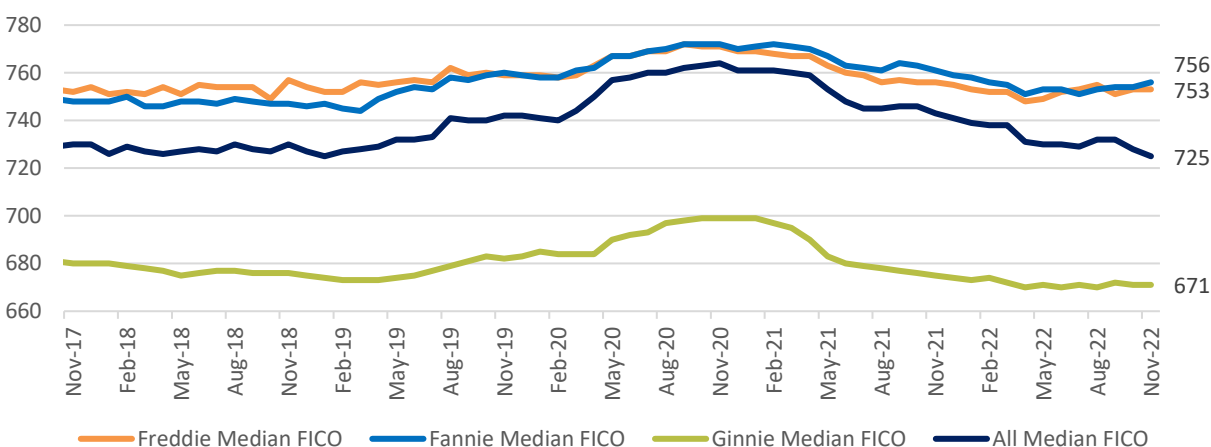


Figure 48. FICO Scores for Purchase Loans

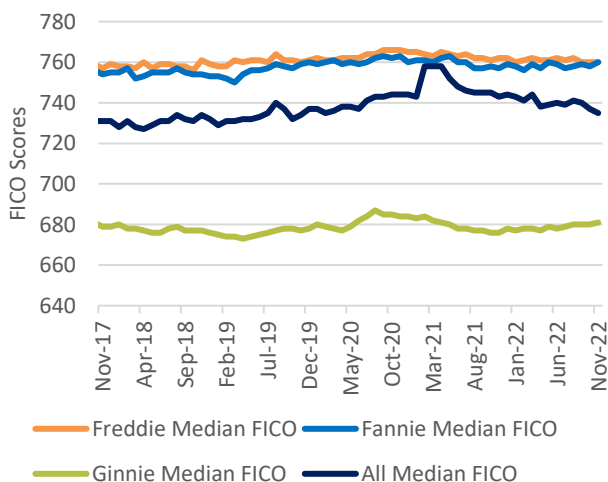
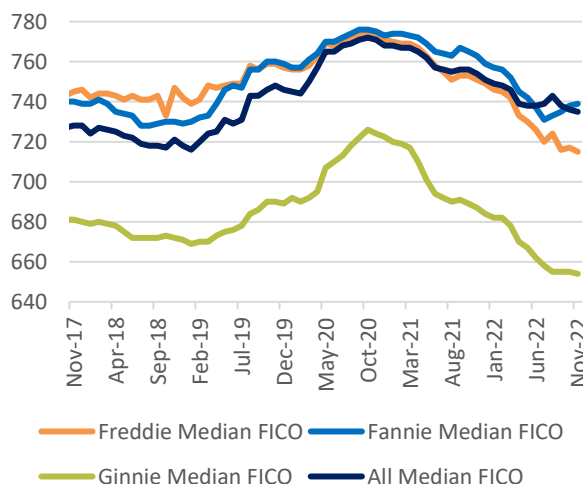


Figure 49. FICO Scores for Refinance Loans



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

In November 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 from 70% in November 2021,

whereas Ginnie Mae LTVs remained relatively flat from 97.63% over that same period. Median LTV for Freddie Mac and Fannie Mae increased 14.3% YoY. Since early 2022, DTIs have been increasing for Ginnie Mae, Freddie Mac, and Fannie Mae and are all higher compared to November 2021.

Figure 50. LTV Ratio for All Loans

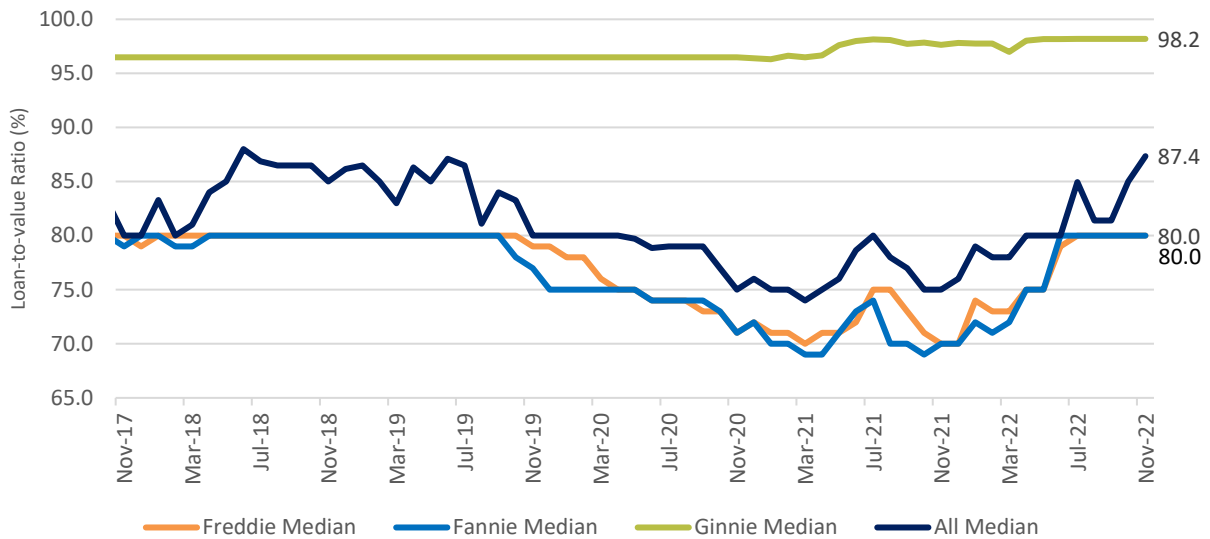
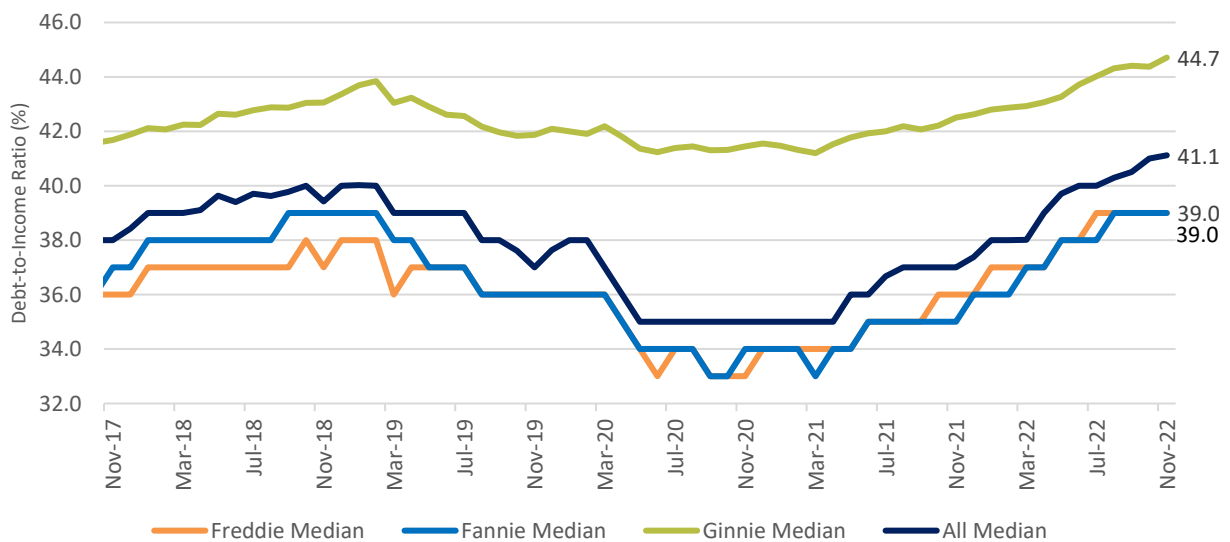


Figure 51. DTI Ratio for All Loans



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

11 FORBEARANCE TRENDS

As of the end of November 2022, 134,820 Ginnie Mae loans were in forbearance. The number of loans in forbearance removed from MBS pools was 742 while 134,078 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

All Loans in Forbearance – November 2022						
	FICO Score*	Note	Current Principal Balance-Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie Mae Bank	671	3.7	\$146,013.27	74.1	85.7	134,820
Nonbank	655	3.4	\$202,670.44	74.3	73.2	121,303
FHA Bank	652	3.5	\$193,040.76	78.2	77.7	98,620
Nonbank	669	3.8	\$144,000.00	85.2	87.7	10,973
VA Bank	651	3.5	\$199,472.02	77.5	76.9	87,640
Nonbank	666	3.2	\$250,000.00	60.6	59.0	25,403
Bank	678	3.4	\$187,182.34	59.3	73.3	1,721
Nonbank	665	3.2	\$254,104.57	60.6	58.3	23,681
Loans in Forbearance and Removed from Pools – November 2022						
	FICO Score*	Note	Current Principal Balance-Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie Mae Bank	653	4.6	\$84,318.77	72.1	72.1	742
Nonbank	670	3.3	\$183,166.07	69.3	56.1	468
FHA Bank	655	3.9	\$128,878.30	74.6	64.2	479
Nonbank	649	4.9	\$84,318.77	76.5	70.9	209
VA Bank	656	3.4	\$168,761.43	73.6	62.0	269
Nonbank	684	3.2	\$210,500.79	59.3	41.6	183
Bank	666	3.8	\$126,001.79	62.4	66.2	33
Nonbank	686	3.1	\$223,642.89	58.8	38.6	150
Loans in Forbearance that Remain in Pools – November 2022						
	FICO Score*	Note	Current Principal Balance-Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie Mae Bank	671	3.7	\$147,672.47	85.9	85.9	134,078
Nonbank	655	3.4	\$202,725.86	74.3	73.3	120,835
FHA Bank	652	3.5	\$193,386.92	78.2	77.8	98,141
Nonbank	670	3.8	\$145,203.65	85.3	87.8	10,764
VA Bank	651	3.5	\$199,579.51	77.5	76.9	87,371
Nonbank	666	3.2	\$250,433.39	60.6	59.1	25,220
Bank	678	3.4	\$188,468.19	59.3	73.4	1,688
Nonbank	665	3.2	\$254,422.73	60.6	58.4	23,531

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 November 2022; *Averages weighted by remaining principal balance of the loans.

The current share of Ginnie Mae loans in forbearance stands at 1.25% as of the end of November 2022, approximately 1.2% lower than observed as of the end of October 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 November 2022.

Figure 52. Share of Ginnie Mae Loans in Forbearance.

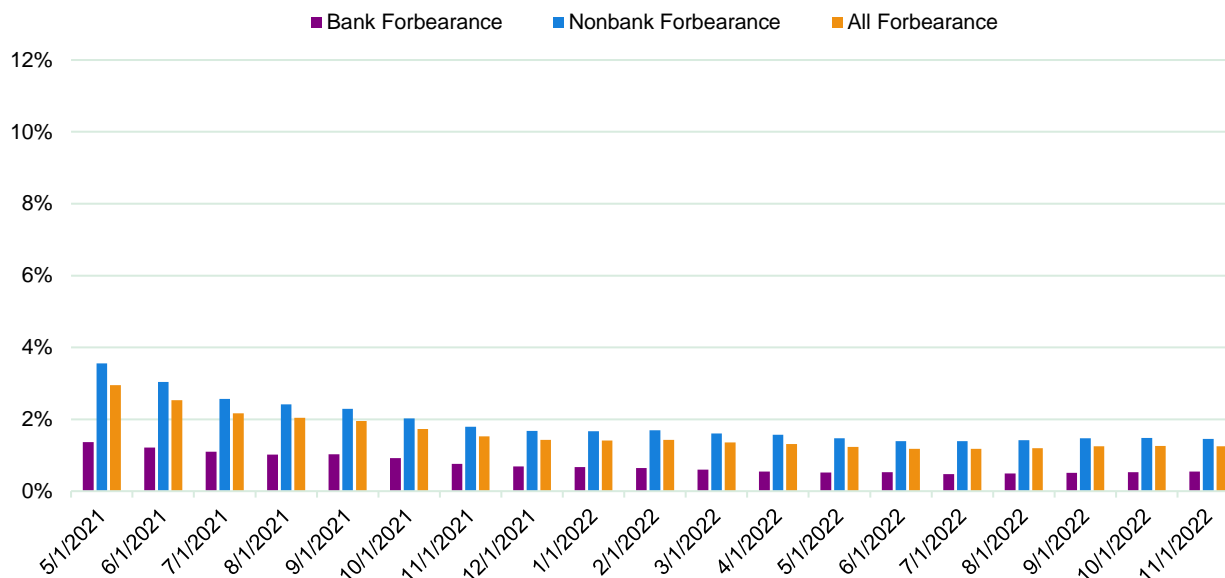


Figure 53. Number of Loans Removed from Pools: Non-bank

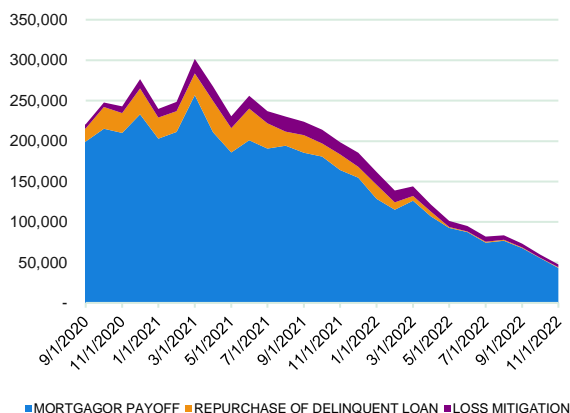
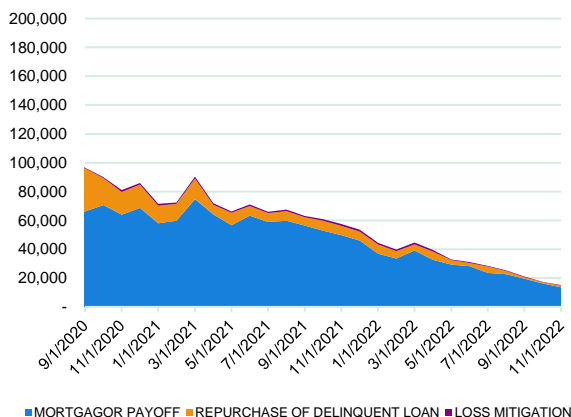


Figure 54. Number of Loans Removed from Pools: Bank



Source: Recursion. Note: Data as of November 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 more likely to have coupons less than 3.5% since May 2022 (bottom charts: “Number of Loans Removed from Pools by Coupon”). In November 2022, the number of loans repurchased due to delinquency increased 42% to 1326 for FHA and increased 9% to 340 for VA loans.

Figure 55. Number of Loans Removed from Pools: FHA

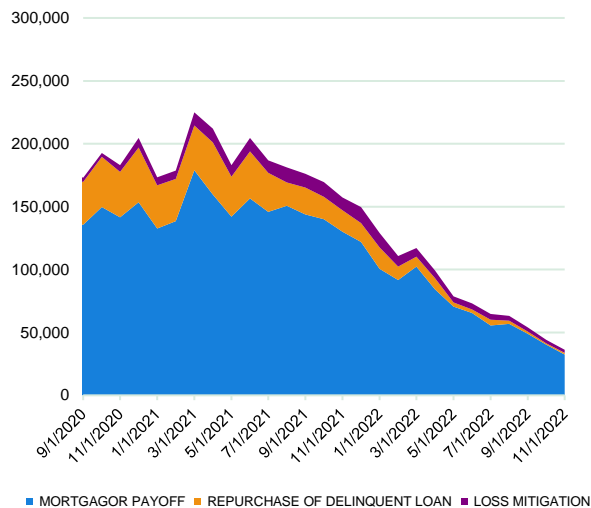


Figure 56. Number of Loans Removed from Pools: VA

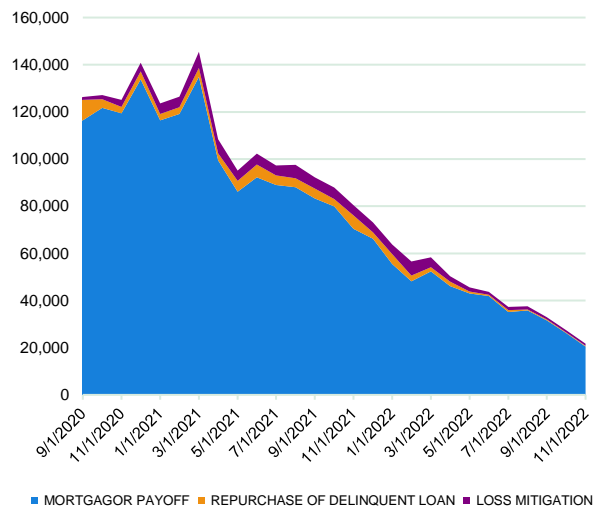
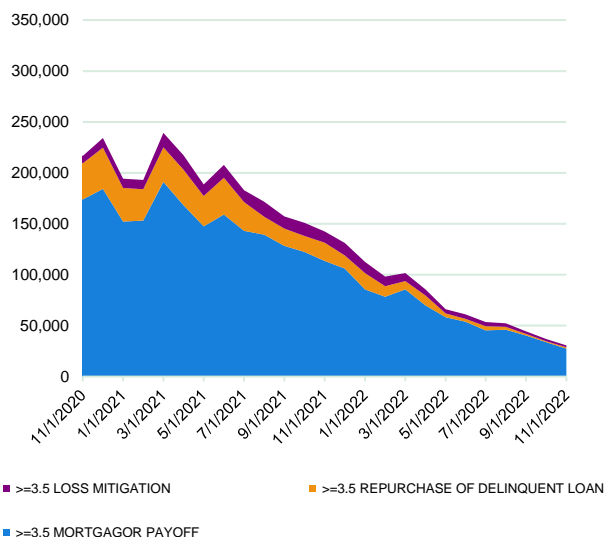
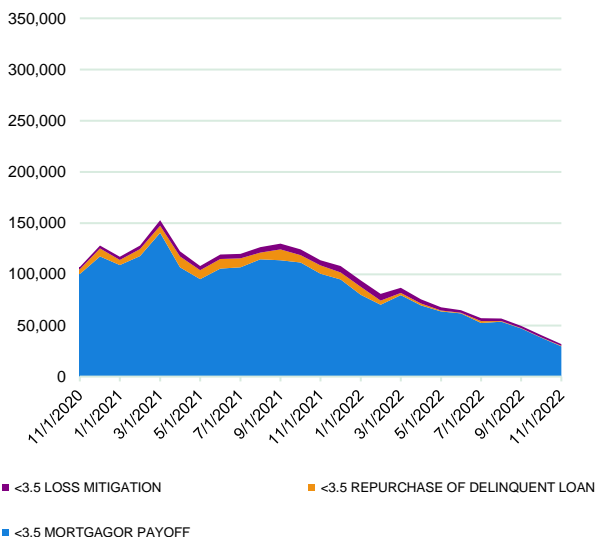


Figure 57. Number of Loans Removed from Pools by Coupon:



Source: Recursion. Note: Data as of November 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 an increase in November, up approximately 2.1% since last month. This increase in non-bank origination share was driven primarily by Freddie Mac (non-bank origination share up 11.1% MoM). The Ginnie Mae non-bank share dropped to 88.8% as of November 2022 but has remained consistently higher than the GSEs since . 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 58. Agency Nonbank Originator Share (All, Purchase, Refi)

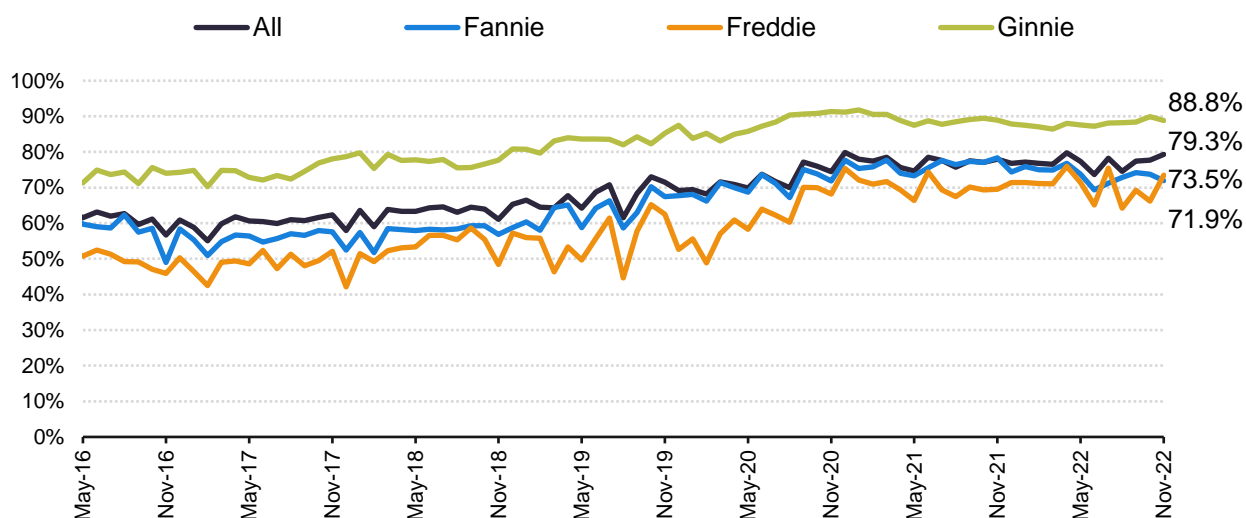


Figure 59. Nonbank Origination Share: Purchase Loans

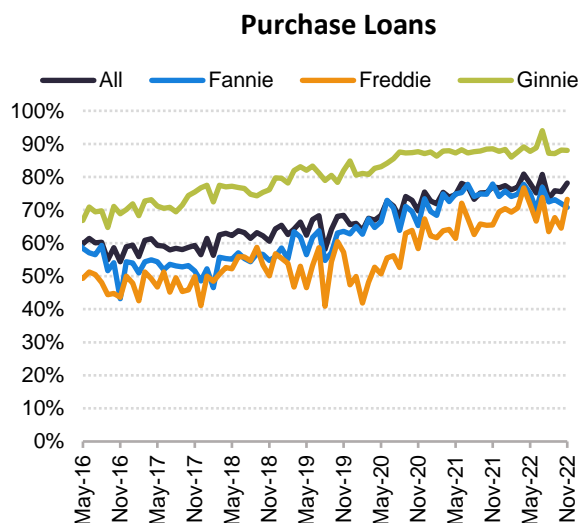
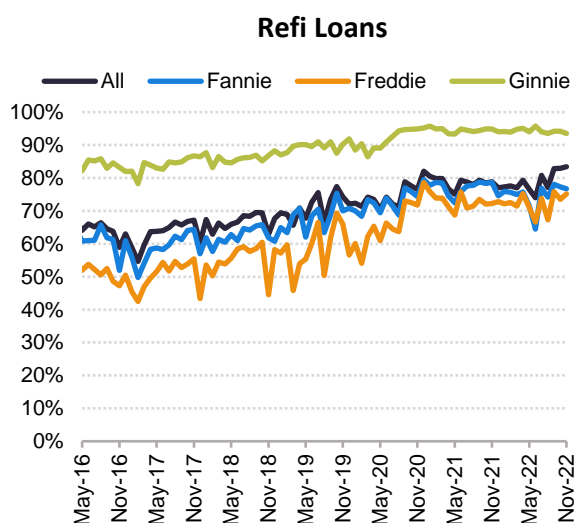


Figure 60. Nonbank Origination Share: Refi Loans



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

Ginnie Mae's total non-bank originator share remained relatively stable in November 2022. Ginnie Mae continues to have a very high proportion of nonbank originations, with a rate of 88.9% in November 2022.

Figure 61. Ginnie Mae Nonbank Originator Share (All, Purchase, Refi)

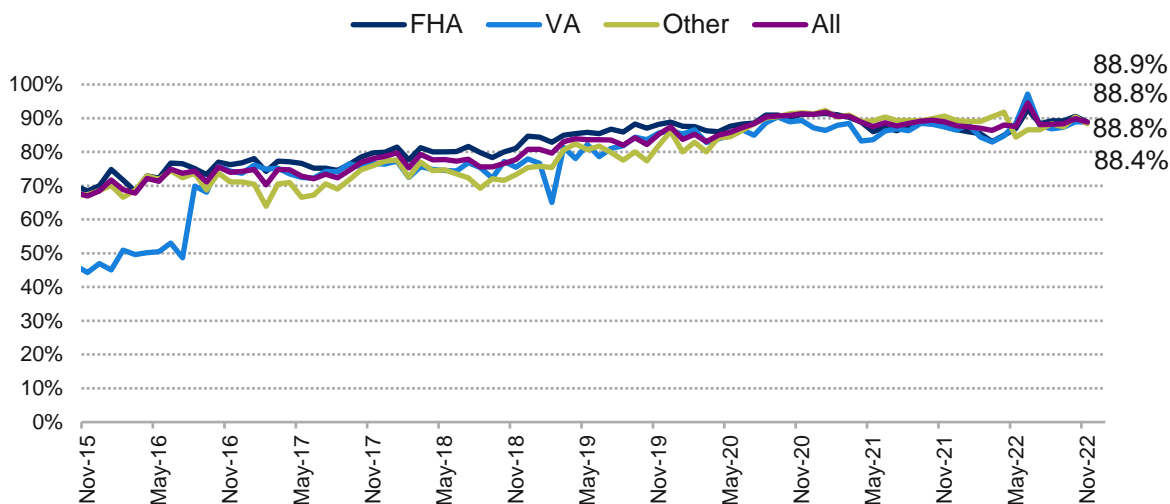


Figure 62. Ginnie Mae Nonbank Share:

Purchase Loans

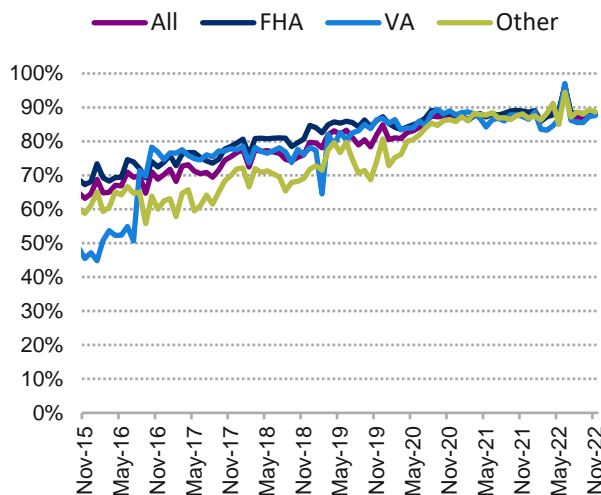
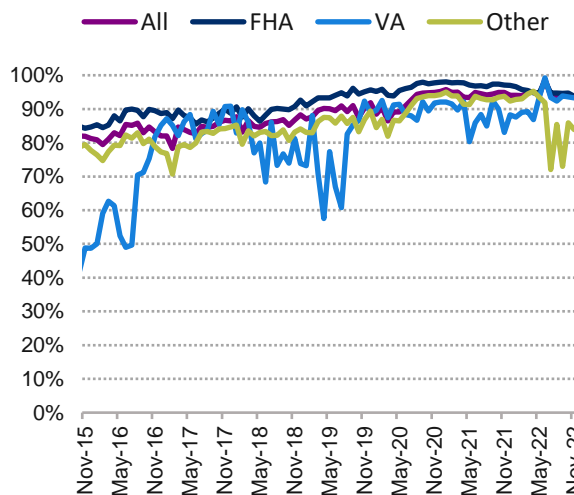


Figure 63. Ginnie Mae Nonbank Share:

Refi Loans



Sources: Recursion. Notes: Data as of November 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 decreased by 4 points from October 2022 to November 2022. The agency median FICO decreased by 3 to 725 MoM.

Figure 64. Agency FICO: Bank vs. Nonbank

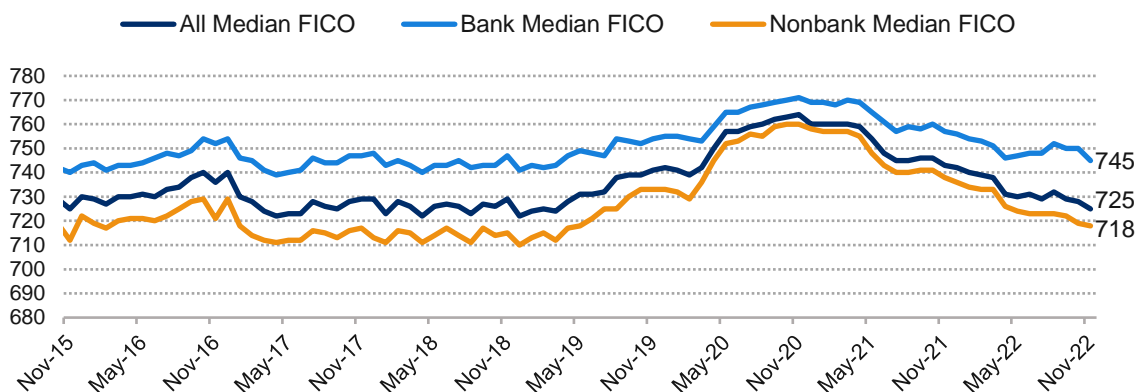


Figure 65. GSE FICO: Bank vs. Nonbank

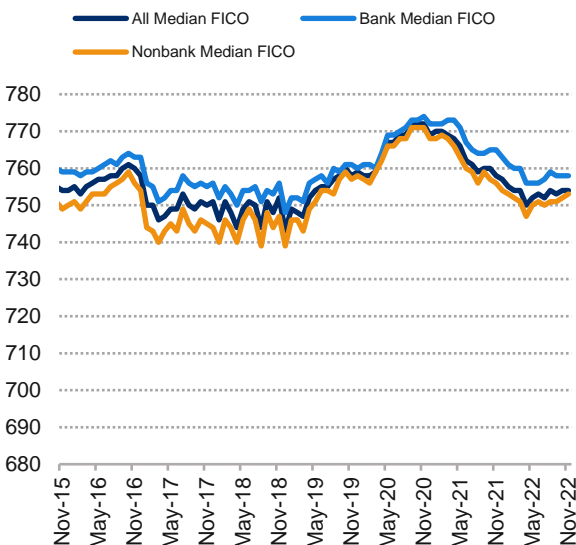
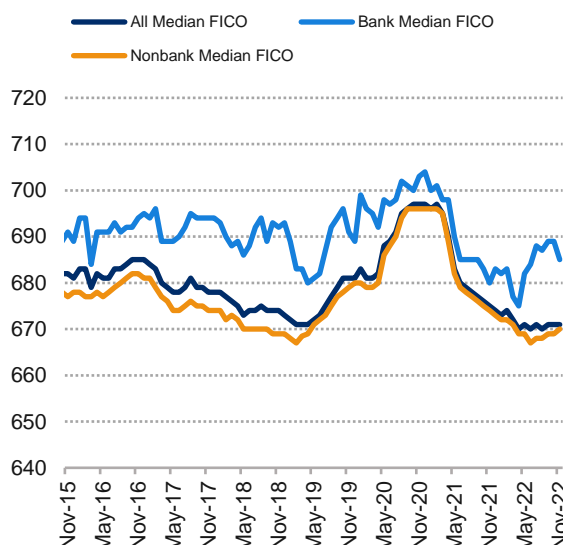


Figure 66. Ginnie Mae FICO: Bank vs. Nonbank



Sources: Recursion; Notes: Data as of November 2022.

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

Figure 67. GSE LTV: Bank vs. Nonbank

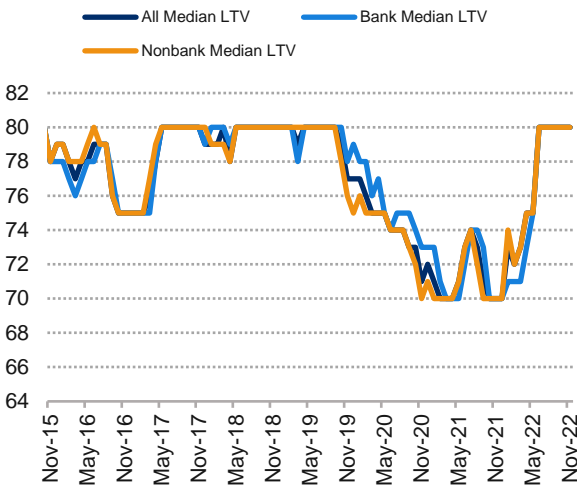


Figure 68. Ginnie Mae LTV: Bank vs. Nonbank

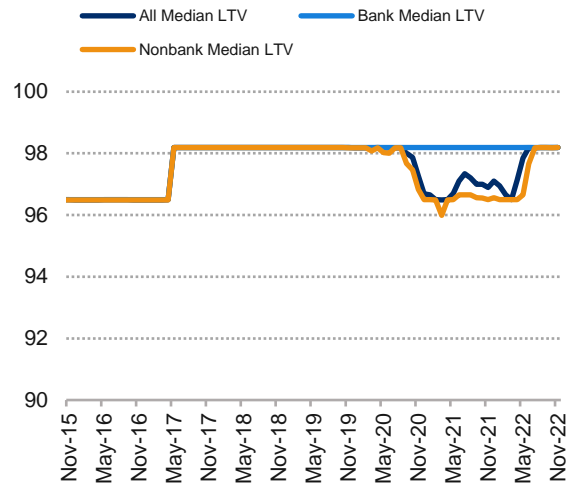


Figure 69. GSE DTI: Bank vs. Nonbank

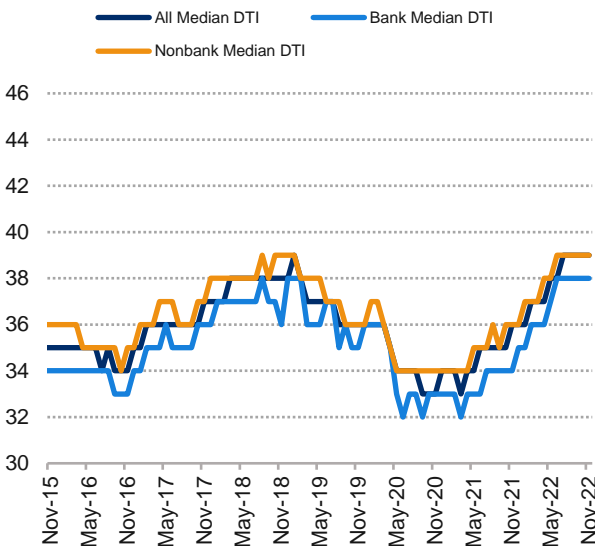
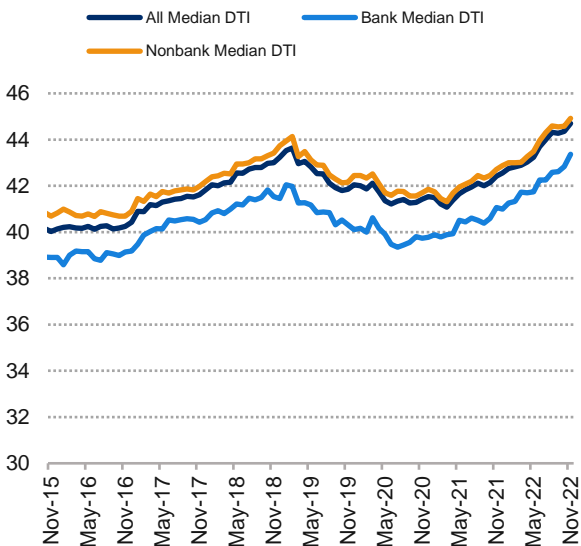


Figure 70. Ginnie Mae DTI: Bank vs. Nonbank



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

In November 2022, the median FICO score for Ginnie Mae bank decreased 4 points to 685 and non-bank increased 1 point to 670 MoM. The median FICO for all Ginnie originations stayed consistent at 671 MoM. The gap between banks and non-banks is most apparent in VA lending (29-point spread).

Figure 71. Ginnie Mae FICO Score:

Bank vs. Nonbank

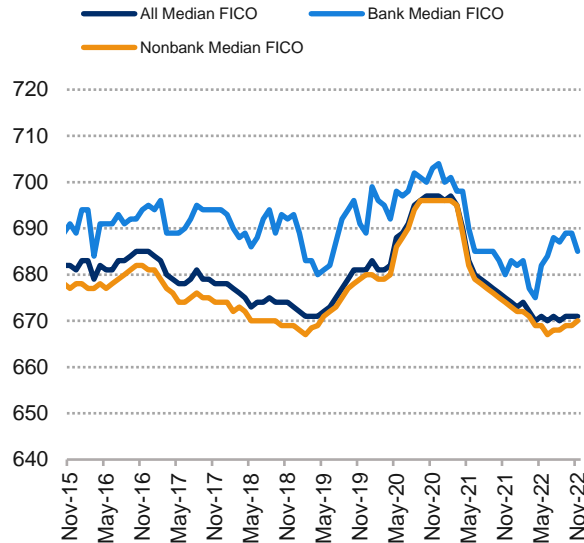


Figure 72. Ginnie Mae FHA FICO Score:

Bank vs. Nonbank

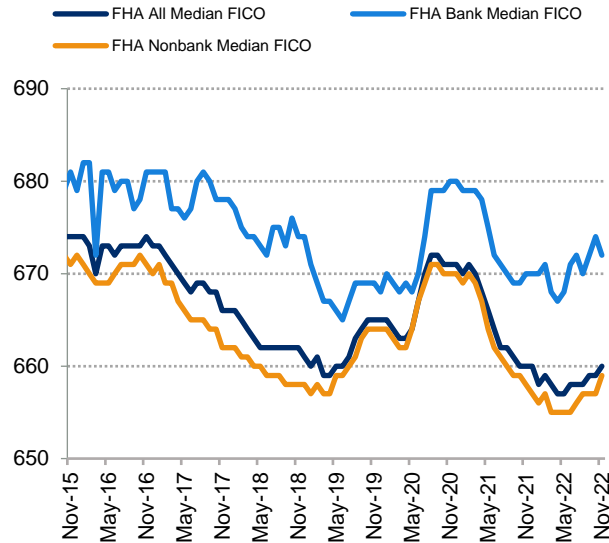


Figure 73. Ginnie Mae VA FICO Score:

Bank vs. Nonbank

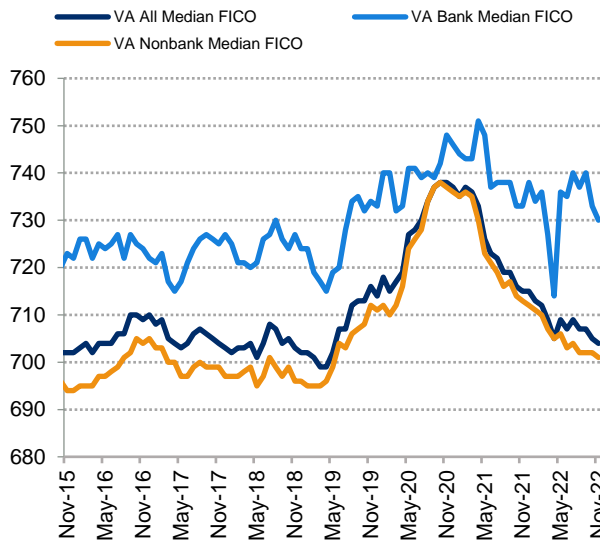
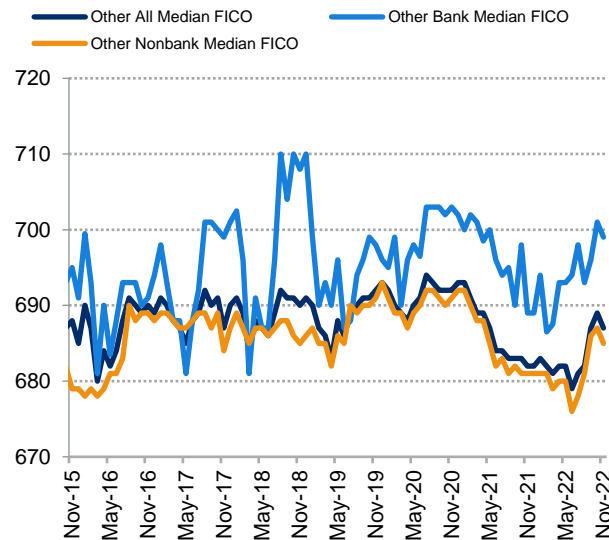


Figure 74. Ginnie Mae Other FICO Score:

Bank vs. Nonbank



Sources: Recursion. Notes: Data as of November 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 75. Ginnie Mae DTI:
Bank vs. Nonbank

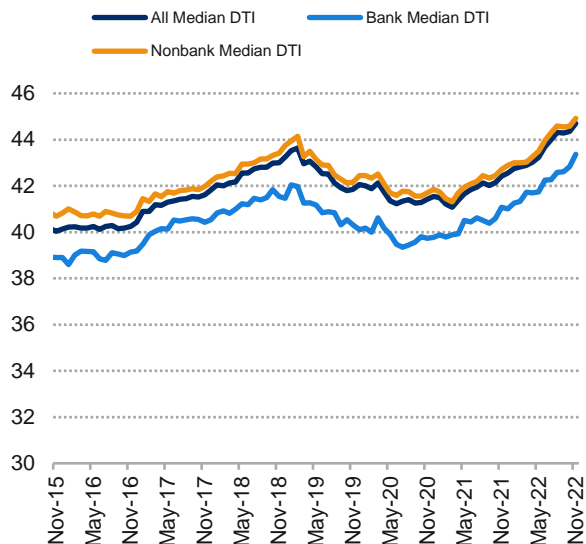


Figure 76. Ginnie Mae FHA DTI:
Bank vs. Nonbank

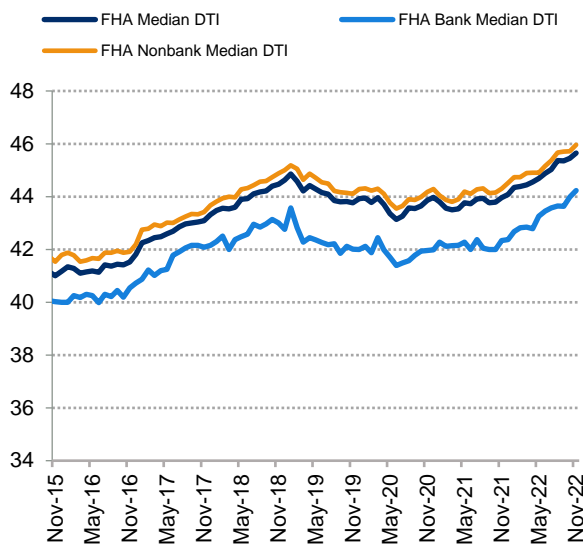


Figure 77. Ginnie Mae VA DTI:
Bank vs. Nonbank

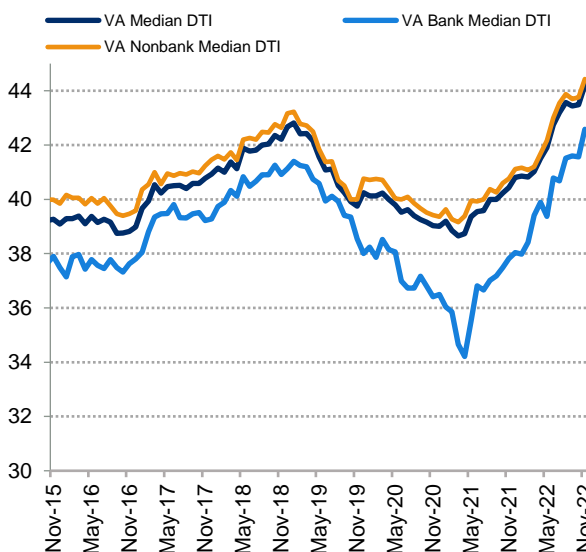
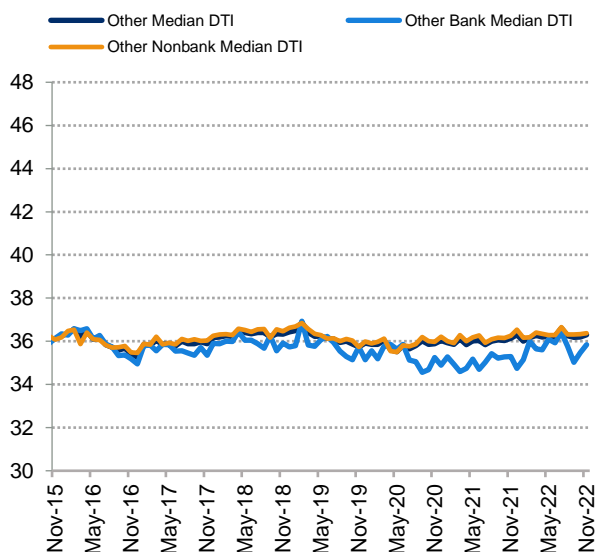


Figure 78. Ginnie Mae Other DTI:
Bank vs. Nonbank



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

U.S. HOUSING MARKET

14 HOUSING AFFORDABILITY

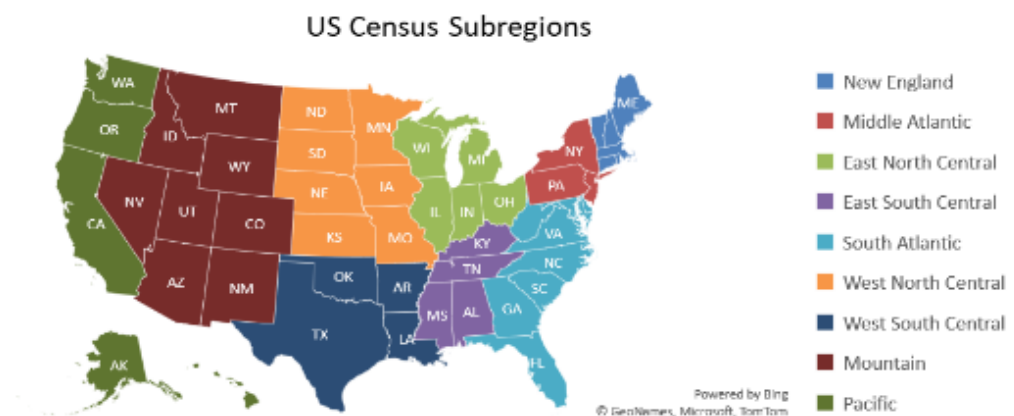
14.1 Housing Affordability – Home Price Appreciation

Home prices are beginning to decelerate, with Compound Annual Growth Rate (CAGR) for HPI at 18.4% between March 2020 and September 2022. Over that same period, the Mountain region has experienced the greatest home price appreciation (21.0% 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	17.9%	16.4%	16.4%	20.2%	21.9%	15.7%	18.0%	21.0%	17.3%	18.4%
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	12-2001 to 11-2002	12-2003 to 11-2004	2-2017 to 1-2018	2-2005 to 1-2006	9-2004 to 8-2005	4-1993 to 3-1994	4-2005 to 3-2006	11-2004 to 10-2005	1-2004 to 12-2004	10-2004 to 9-2005
Max 12-Month HPI Growth, Pre-Pandemic	14.0%	12.4%	6.8%	8.5%	15.3%	7.4%	7.4%	18.1%	22.3%	10.7%

Figure 79. 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 = $(\text{End Value}/\text{Starting Value})^{1/n} - 1$

S&P's CoreLogic Case-Shiller US National Housing Price Index's November 29, 2022, reporting September data indicated that home price gains continued to slow across the country. In September, just a 10.6% annual gain was reported, down from 12.9% compared to the month prior. This latest reported MoM HPI appreciation value suggests home prices have started to show signs of continued 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	66.7%	-5.4%	55.7%	9.3%	47.4%
AL	41.6%	-15.1%	92.5%	14.7%	63.4%
AR	39.9%	-11.1%	83.7%	14.6%	63.2%
AZ	110.3%	-49.5%	239.1%	18.6%	71.2%
CA	144.9%	-47.1%	170.0%	11.8%	43.0%
CO	32.3%	-10.3%	177.5%	13.8%	148.9%
CT	72.8%	-19.7%	54.3%	11.6%	23.9%
DC	163.1%	-11.7%	120.9%	4.2%	95.0%
DE	88.5%	-23.5%	71.5%	11.8%	31.1%
FL	130.0%	-46.5%	210.7%	23.2%	66.2%
GA	36.0%	-27.1%	156.6%	17.6%	87.0%
HI	139.0%	-27.1%	131.4%	15.2%	68.7%
IA	27.8%	-5.4%	72.9%	10.7%	63.5%
ID	73.4%	-32.2%	249.4%	14.1%	136.8%
IL	49.9%	-23.8%	62.8%	10.2%	24.1%
IN	19.0%	-8.6%	102.1%	12.8%	84.7%
KS	31.0%	-7.7%	88.0%	12.1%	73.5%
KY	28.9%	-5.4%	85.8%	11.6%	75.8%
LA	51.6%	-6.7%	59.7%	9.0%	48.9%
MA	69.9%	-18.3%	97.3%	10.4%	61.2%
MD	126.4%	-26.4%	67.4%	9.6%	23.2%
ME	72.1%	-12.4%	109.5%	16.5%	83.5%
MI	18.5%	-31.6%	137.5%	11.4%	62.5%
MN	52.6%	-23.0%	101.8%	9.0%	55.3%
MO	39.3%	-15.0%	98.5%	12.7%	68.8%
MS	38.9%	-12.8%	67.2%	13.7%	45.8%
MT	79.5%	-13.5%	138.9%	17.8%	106.7%
NC	39.7%	-14.1%	123.8%	18.9%	92.1%
ND	51.7%	-0.8%	85.8%	8.5%	84.3%
NE	24.3%	-5.9%	99.1%	11.0%	87.3%
NH	72.8%	-21.9%	111.0%	14.8%	64.7%
NJ	102.3%	-22.8%	70.7%	12.4%	31.9%
NM	66.4%	-17.9%	79.1%	13.5%	47.1%
NV	117.4%	-59.4%	259.7%	15.4%	46.2%
NY	75.7%	-10.6%	76.8%	12.1%	58.2%
OH	19.5%	-16.6%	100.6%	11.9%	67.3%
OK	36.8%	-4.5%	83.1%	12.8%	74.9%
OR	85.6%	-28.6%	158.3%	10.9%	84.4%
PA	68.8%	-10.9%	75.5%	10.5%	56.3%
RI	108.3%	-28.2%	105.3%	13.0%	47.4%
SC	40.6%	-16.0%	122.3%	17.5%	86.8%
SD	40.2%	-2.3%	102.6%	14.9%	97.8%
TN	38.3%	-12.6%	144.3%	18.8%	113.5%
TX	35.8%	-3.0%	131.7%	15.4%	124.7%
UT	65.1%	-26.0%	199.2%	15.6%	121.3%
VA	95.1%	-18.8%	80.4%	11.9%	46.4%
VT	78.5%	-10.5%	80.1%	13.7%	61.2%
WA	83.3%	-27.3%	182.3%	13.5%	105.1%
WI	38.6%	-14.3%	92.1%	11.9%	64.6%
WV	39.3%	-5.9%	57.7%	11.3%	48.4%
WY	84.7%	-9.7%	77.1%	13.9%	60.0%

Source: FHFA/S&P Corelogic Case-Shiller US National Housing 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 November, inflation has dropped to 7.1%. Nationally, rents are up 7.5 percent YoY, the third time in 2022 that yearly increases have dropped into the single digits. Wage growth decreased slightly from 6.5% in October to 6.4% in November. September 2022 reporting data shows YoY home price appreciation has now decreased to 10.6% down from 13.0% of August 2022.

Figure 80. Inflation | 12-Month Percent Change in CPI

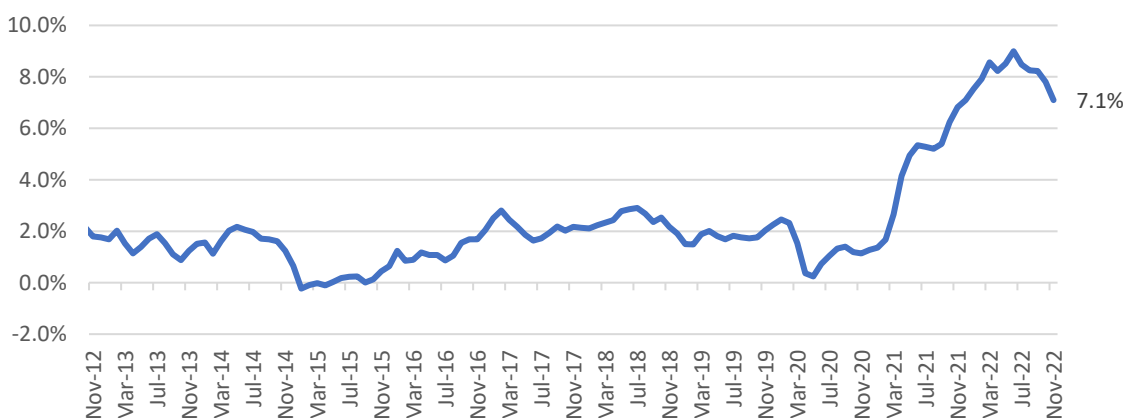
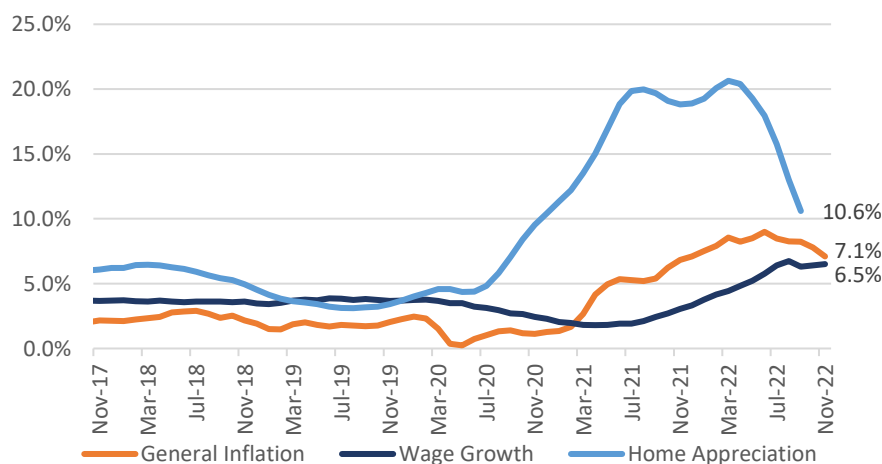


Figure 81. Asset Price Appreciation vs. Wage Increases



Metric	Statistic
General Inflation	7.1%
Home Price Appreciation	10.6%
Rental Price Appreciation (Median Rent Change YoY)	7.5%
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

The Federal Funds Target Rate was raised in early November 2022 by 75 bps and once again by half a percentage point in December to a range of 4.25% and 4.50%. This is the seventh consecutive increase in 2022.⁷ Despite these latest rate hikes, mortgage rates have not sustained their peak levels. As of December 15, 2022, the average 30-year and 15-year fixed rate mortgage rates were 6.31% and 5.54% respectively. The average 30-year fixed rate mortgage rate decreased 27 bps and the average 15-year fixed rate mortgage rate decreased 36 bps MoM.

Figure 82. Average Fixed Rate Mortgage Rates



Sources: FRED data as of December 2022

⁷<https://www.federalreserve.gov/newsevents/pressreleases/monetary20221214a1.htm#:~:text=The%20Board%20of%20Governors%20of,%2C%20effective%20December%2015%2C%202022.>

14.3 Housing Inventory

As of October 2022, there was 8.9 months of housing inventory on the market, a decrease from 9.2 in September. October housing inventory values were down by 3.3% 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 83. Single-Family Housing Inventory

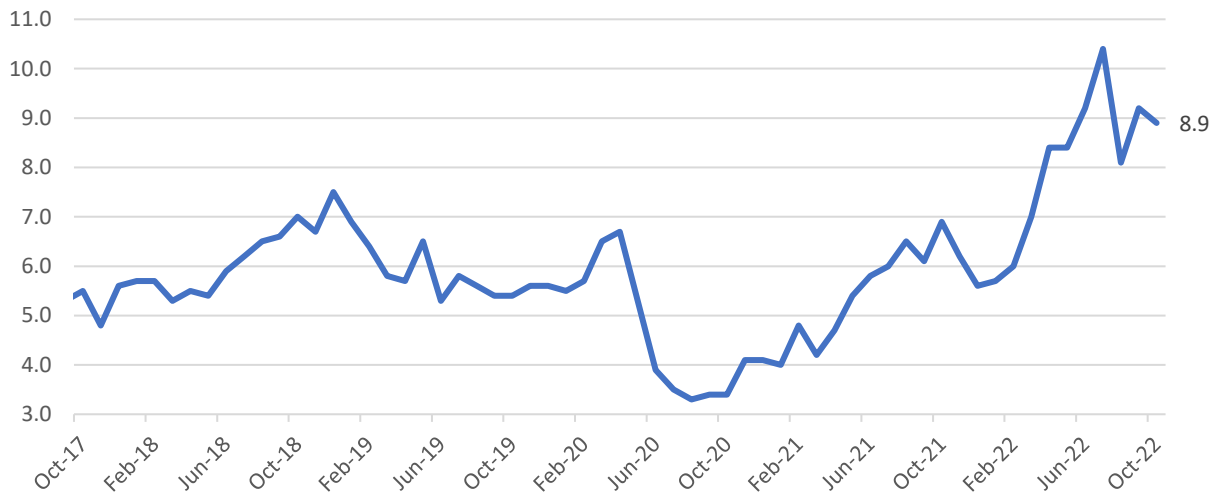
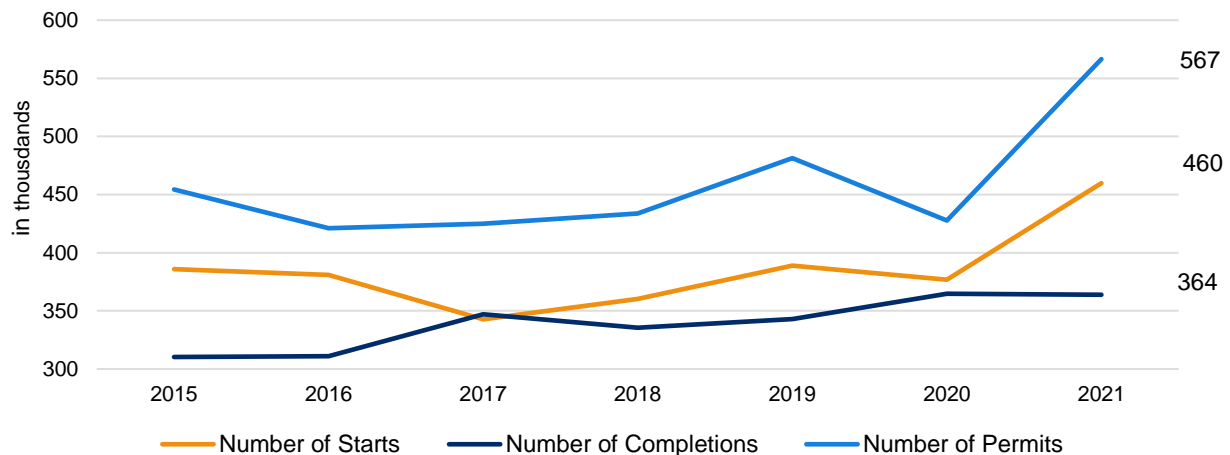


Figure 84. Multifamily Construction Metrics: Permits, Starts, Completions



Source: FRED data as of October 1, 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 \$41.8 trillion in Q3 2022. The total value of the US housing market is up 120% from its trough in 2011. From Q4 2021 to Q3 2022 mortgage debt outstanding increased from \$11.7 trillion to \$12.3 trillion and household equity increased from \$25.3 trillion to \$29.5 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 \$8.81 trillion in Q3 2022, agency SF MBS continues to account for a growing percentage of the total mortgage debt outstanding, up to 67% of total mortgage debt from just 52% in 2011.

Figure 85. Value of the US Housing Market

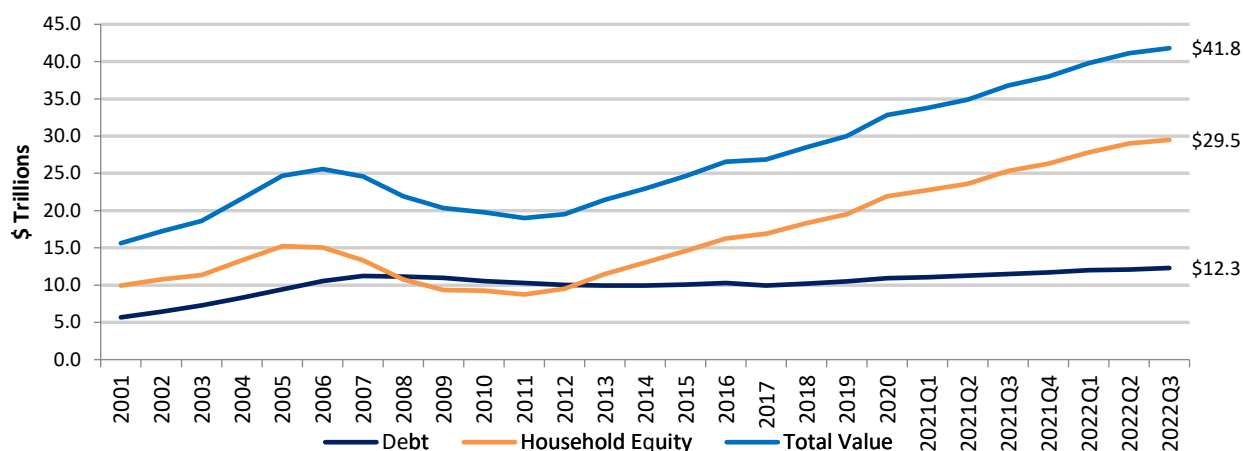
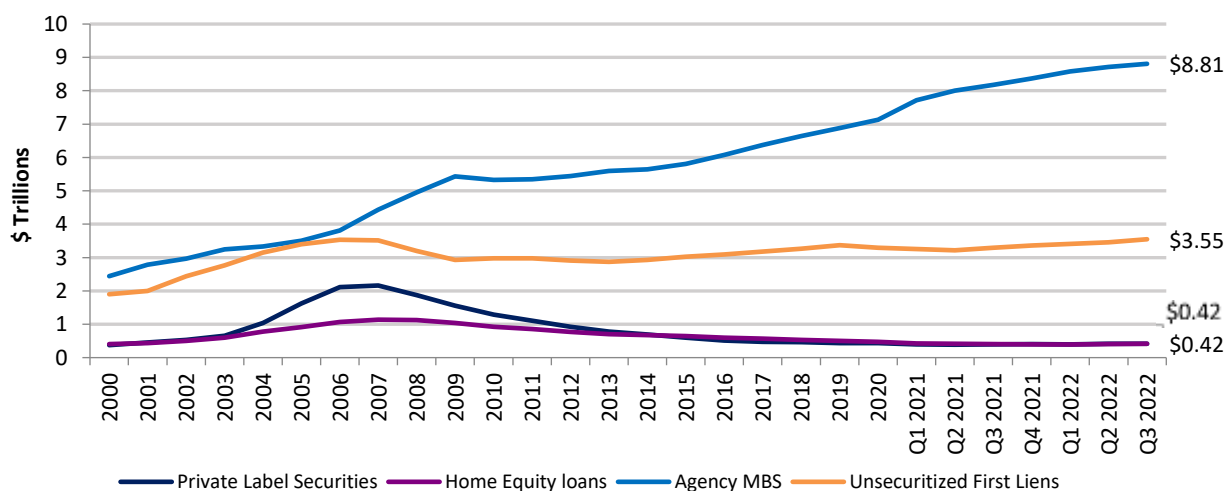


Figure 86. Size of the US Residential Mortgage Market.



Source: Federal Reserve Flow of Funds Data as of Q3 2022.

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.

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