

GLOBAL MARKETS ANALYSIS REPORT

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Office of Capital Markets



June 2023

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

This month's *Highlights* section focuses on the increase in foreign ownership of Agency Bonds, which has emerged as a significant demand trend in the global market. Through comprehensive tables presenting regional and country-specific data, this section explores the implications of these shifts in bond holdings by foreign entities.

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

- 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 includes home price indices for each of the U.S. census regions by quarter. The market shows signs of sticky inflation and increasing mortgage rates. Home prices are increasing at a much slower pace than seen in 2021 and 2022 but remain high. This section also includes an analysis of the average price of homes sold to median income buyers, which shows housing affordability remains historically low.

Highlights

Foreign ownership of Agency Bonds is accelerating with foreign holdings increasing by \$30.8 billion through March, the latest Treasury data that is available¹. In contrast to calendar year 2022, foreign holdings of Agency Bonds decreased by \$2.7 billion. This demand from foreign entities comes at a time in which higher interest rates and elevated home prices have slowed both mortgage loan originations and mortgage-backed security production.

Although foreign entities were net sellers of Agency Bonds in calendar year 2022, driven by large scale Agency Bond sales during the first quarter of 2022, beginning in April 2022 foreign entities began significant increases in their holdings of Agency Bonds. Since April 2022, foreign entities have accumulated approximately \$108 billion of additional holdings, timing that coincides with the end of the Federal Reserve’s quantitative easing process.

Foreign ownership of US Treasuries increased by \$241.9 billion in the first quarter of 2023 after decreasing by \$384.6 billion in 2022. The historically wide mortgage basis and higher yields of Agency MBS relative to Treasuries is likely contributing to the ongoing increase in foreign demand for MBS securities although overall MBS production continues to slow.

Table 1 shows the outright foreign holdings of Agency Bonds as of March 2023, year-end 2022, and year-end 2021, in addition to year-to-date (YTD) and 2022 YoY changes by geographic area. As seen below, Asia increased their holdings of Agency Bonds by \$14.9 billion since year-end 2021 (“YTD Change” plus “2022 Change”). Over the same time period, Asia decreased their holdings of Treasuries by \$374.9 billion.

Table 1: Agency Bond Holdings by Geographic Area (USD in Millions)²					
Geographic Area	March 2023	Y/E 2022	Y/E 2021	YTD Change	2022 Change
Total Asia	867,037	836,243	852,105	30,794	(15,862)
Total Europe	192,643	200,983	206,480	(8,340)	(5,497)
Total Caribbean	70,691	72,303	73,028	(1,612)	(725)
Total Latin America	21,129	20,187	18,609	942	1,578

On the other hand, Europe and the Caribbean have been net sellers of Agency Bonds in both time periods listed above while being net buyers of Treasuries. Latin America has increased their holdings of Agency Bonds thus far in 2023 and YoY 2022, \$942 million and \$1.6 billion, respectively.

Table 2 shows the outright holdings of Agency Bonds by country as of March 2023, year-end 2022, and year-end 2021, in addition to year-to-date (YTD) and 2022 YoY changes. In 2022, China was the

¹ As of March 2023, 92.8% of Agency Bond Holdings were asset-backed securities. Holdings represent the market value of securities as of March 2023.

² Sources: Treasury International Capital (TIC), as of March 2023.

largest accumulator of Agency Bonds adding \$48.9 billion of holdings followed by Canada, \$19.0 billion, and Luxembourg, \$12.6 billion, versus Taiwan and Japan offloading \$34.1 billion and \$23.9 billion, respectively.

Country	March 2023	Y/E 2022	Y/E 2021	YTD Change	2022 Change
Japan	287,050	278,068	301,979	8,982	(23,911)
China, Mainland	263,891	251,566	202,668	12,325	48,898
Taiwan	212,782	210,309	244,375	2,473	(34,066)
Canada	105,527	97,234	78,224	8,293	19,010
Luxembourg	51,268	47,142	34,558	4,126	12,584
United Kingdom	41,147	61,418	73,011	(20,271)	(11,593)
Korea, South	38,146	36,240	42,051	1,906	(5,811)
Cayman Islands	29,485	30,954	35,206	(1,469)	(4,252)
Ireland	25,100	22,478	21,323	2,622	1,155
France	22,578	19,805	16,870	2,773	2,935
Netherlands	19,728	14,145	16,278	5,583	(2,133)
Bermuda	19,419	19,008	23,212	411	(4,204)
Malaysia	17,423	14,822	18,830	2,601	(4,008)
Bahamas	16,737	17,649	10,850	(912)	6,799
Mexico	13,150	12,716	12,942	434	(226)
Thailand	13,043	12,962	13,193	81	(231)
Indonesia	9,678	8,976	5,451	702	3,525
Belgium	9,269	8,381	10,349	888	(1,968)
Switzerland	7,941	13,195	19,770	(5,254)	(6,575)
Hong Kong	7,014	7,093	9,280	(79)	(2,187)
Total³	1,210,376	1,184,161	1,190,420	26,215	(6,259)

Noticeably, countries such as Indonesia, The Bahamas, The Netherlands, France, Ireland, Luxembourg, Canada, and China have increased their holdings substantially since year-end 2021 and relative to their Treasury holdings.

[Section 8.4](#), “Foreign Ownership of Agency Debt and Agency MBS”, of this month’s Global Market Analysis Report examines the top 10 holders of Agency Debt and their YoY changes as well as their quarter-over-quarter changes as the data becomes available.

³ Total is the sum of the top 20 foreign holders of Agency Bonds as of March 2023 and these top 20 holders made up 95.1% of total foreign holdings.

1 US AGGREGATE AND GLOBAL INDICES

1.1 Bloomberg US Aggregate and Global Indices

At month-end May, 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) contributes approximately 27%. For the US Aggregate Index, all other changes to the index components were no larger than 1%.

Figure 1. Bloomberg US Aggregate Index

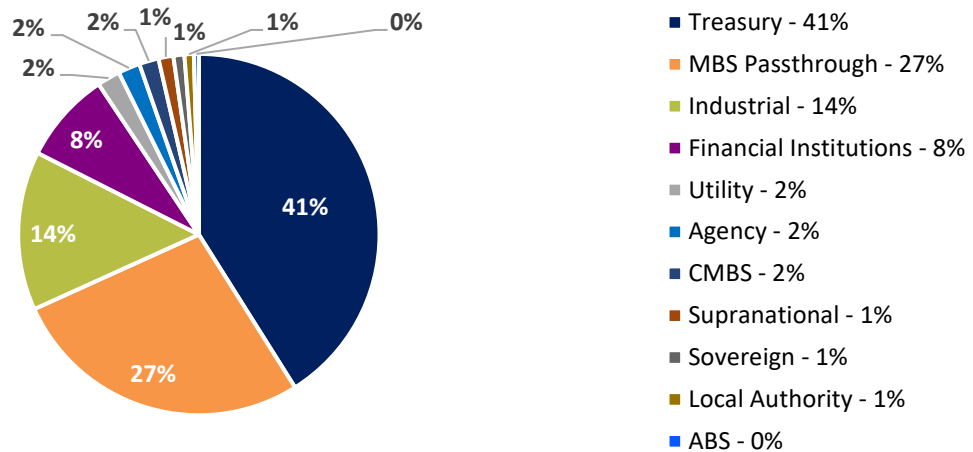
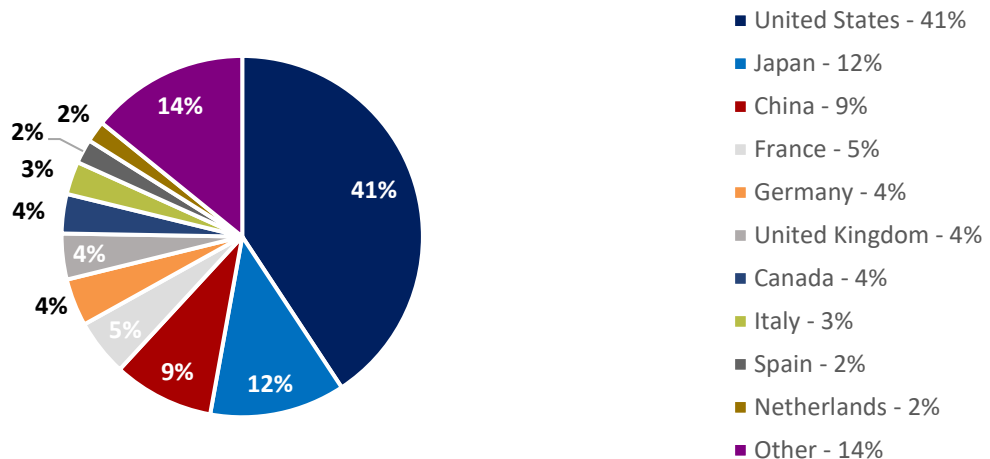


Figure 2. Bloomberg Global Aggregate Index by Country

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, up slightly from the prior month. Japan’s share of fixed income is the second highest at 12%, up slightly from the prior month. For the Global Aggregate Index, all countries remained stable compared to the prior month with no changes larger than 1%.



Source: Bloomberg [both charts]. Note: Data as of May 2023. Figures in charts may not add to 100% due to rounding.

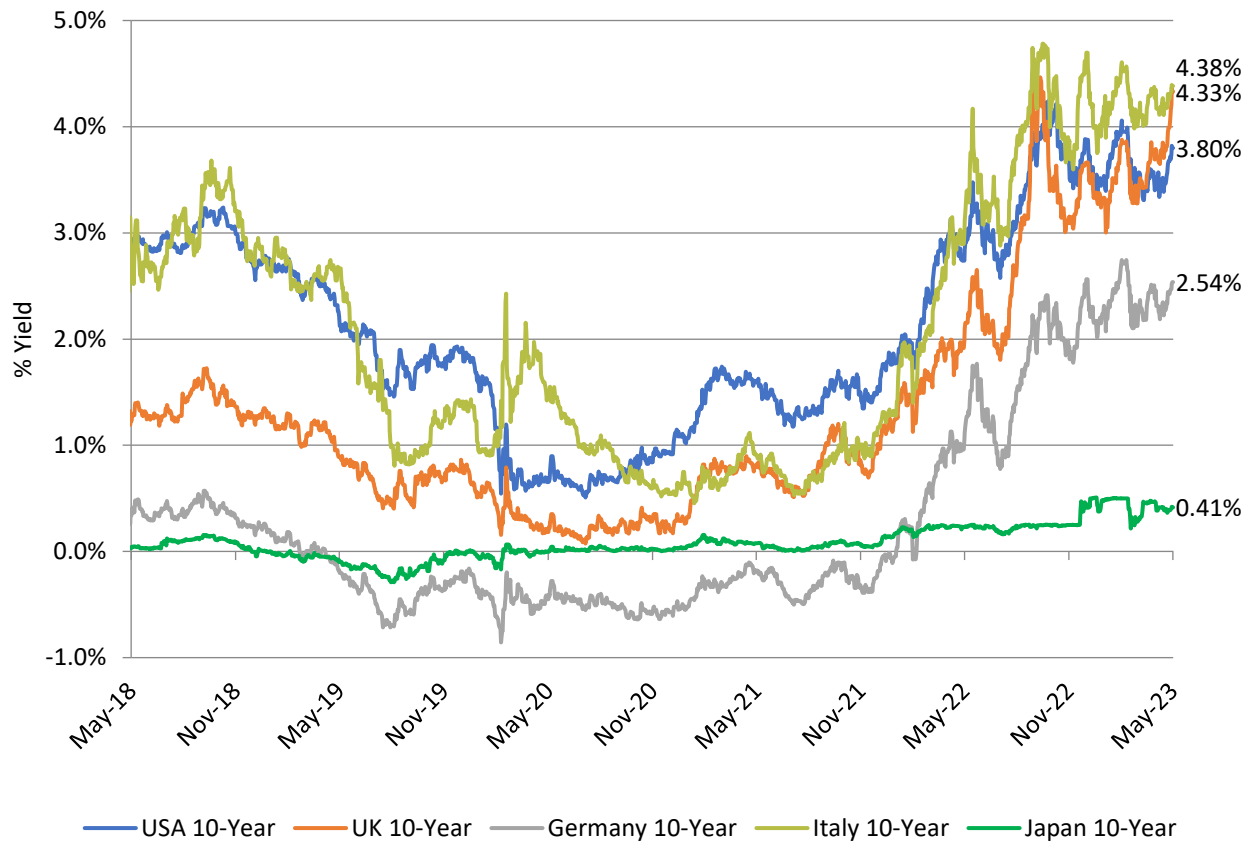
2 SOVEREIGN DEBT PRODUCT PERFORMANCE COMPARISONS

2.1 Global 10-Year Treasury Yields (Unhedged)

The US 10-year Treasury yield moved to 3.80% at month-end May 2023, a MoM increase of 35 bps. US Treasury yields are the third highest of all the government treasury yields depicted in the figure below behind Italian and UK government bond yields.

- The yield on the UK 10-year notes increased to 4.33% at month-end May, a MoM increase of 60 bps.
- The yield on the German 10-year increased to 2.54% at month-end May, a MoM increase of 14 bps.
- The yield on the Italian 10-year increased to 4.38% at month-end May, a MoM increase of 12 bps.
- The yield on the Japanese 10-year notes decreased to 0.41% at month-end May, a MoM decrease of 4 bps.

Figure 3. Global 10-Year Treasury Yields



Source: Bloomberg. Note: Data as of May 2023.

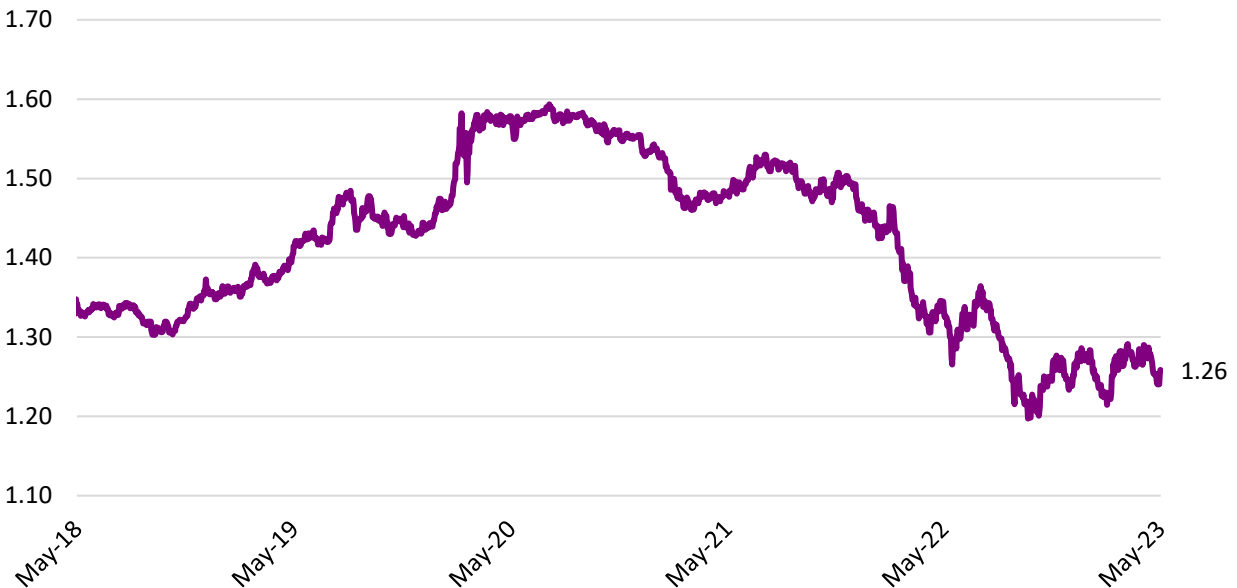
2.2 US Treasury Hedged Yields

- The hedged yield for the 10-year Treasury JPY decreased MoM by 4 bps to 2.16% at month-end May.
- The hedged yield for the 10-year Treasury EUR decreased MoM by 2 bps to 1.26% at month-end May.

Figure 4. 7–10yr Total Return Hedged Index, JPY



Figure 5. 7–10yr Total Return Hedged, EUR



Source: Bloomberg. Note: Data as of May 2023.

SECONDARY MORTGAGE MARKET

3 FIXED INCOME PRODUCT PERFORMANCE COMPARISONS

3.1 Ginnie Mae Yields – USD

Ginnie Mae II yields were 4.94% in March, increased 20 bps to 5.14% by month-end April, then increased 36 bps to 5.50% by month-end May. Ginnie Mae I yields were 4.95% in March, increased 12 bps to 5.07% by month-end April, then increased 22 bps to 5.29% by month-end May. The yields on the Ginnie Mae I were 149 bps higher than the US 10-year Treasury yield at month-end May 2023, a decrease of 13 bps MoM. Ginnie Mae II spreads over the US 10-year Treasury yield increased 78 bps YoY to 170 bps over the US 10-year Treasury yield by month-end May 2023.

Figure 6. Ginnie Mae II SF Yield, USD



Figure 7. Ginnie Mae I SF Yield, USD



Sources Bloomberg. Note: Data as of May 2023.

3.2 Ginnie Mae Hedged Yields

The yield for the Ginnie Mae II, hedged in the Japanese Yen stood at 3.86% at month-end May, a 4 bps decrease MoM. The yield for the Ginnie Mae II, hedged in the Euro, stood at 2.96% at month-end May, a 1 bp decrease MoM.

The yield for the Ginnie Mae I, hedged in the Japanese Yen, stood at 3.65% at month-end May, an 18 bps decrease MoM. The yield for the Ginnie Mae I, hedged in the Euro, stood at 2.75% at month-end May, a 15 bps decrease MoM.

Figure 8. Ginnie Mae I and II Hedged, JPY

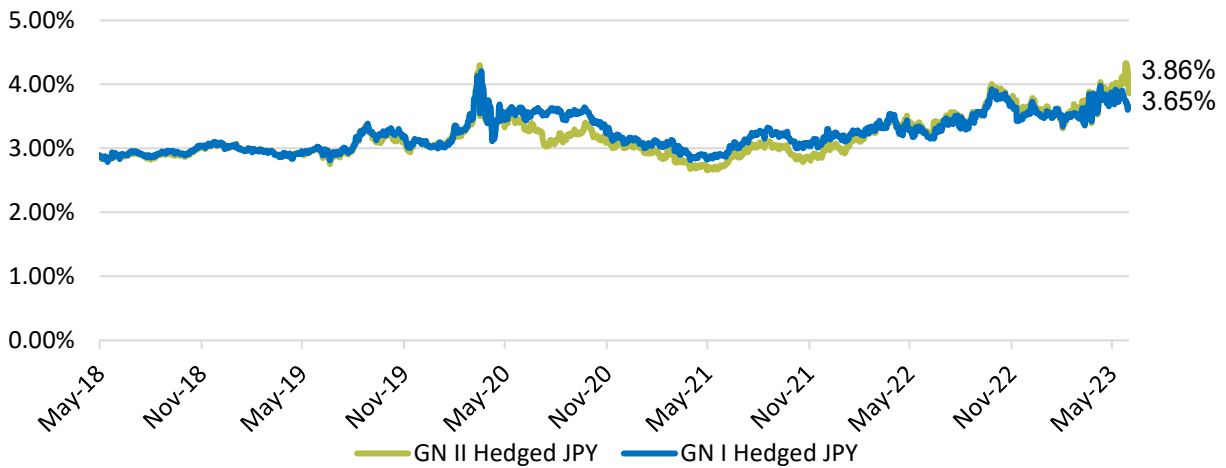
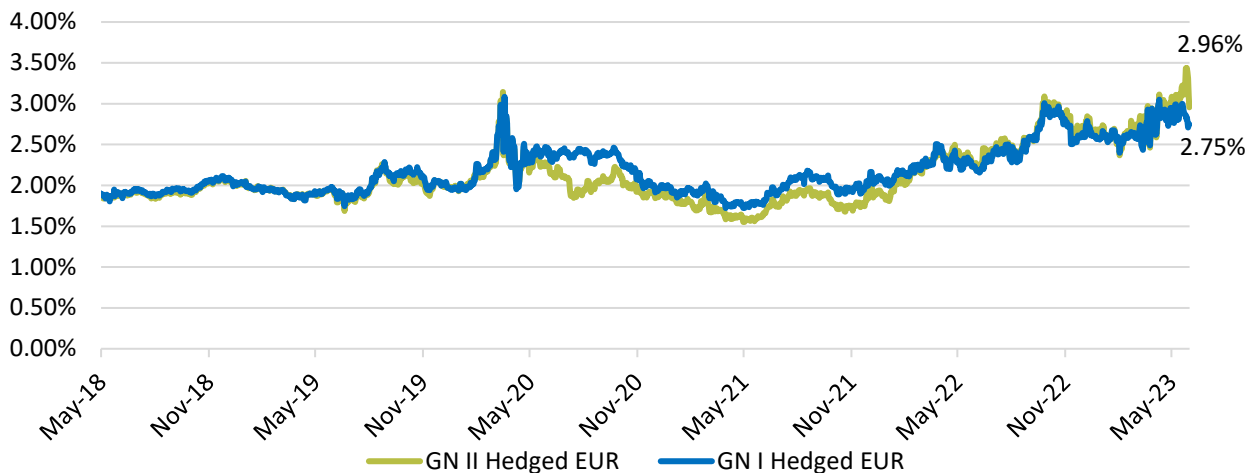


Figure 9. Ginnie Mae I and II Hedged, EUR



Source: Bloomberg. Note: Data as of May 2023.

Note: Hedged yield calculations assume hedge costs for Ginnie Mae securities are equivalent to those for U.S. Treasuries.

3.3 Ginnie Mae Yield Spreads – Intermediate Credit

The yield differential between US Intermediate Credit and GNMA II 30-year OAS increased by 8 bps to 0.58% at month-end May. The GNMA II 30-year OAS decreased 8 bps MoM as of month-end May. The US Intermediate credit OAS was unchanged MoM as of month-end May.

Figure 10. US GNMA II 30yr MBS OAS versus US Intermediate Credit OAS

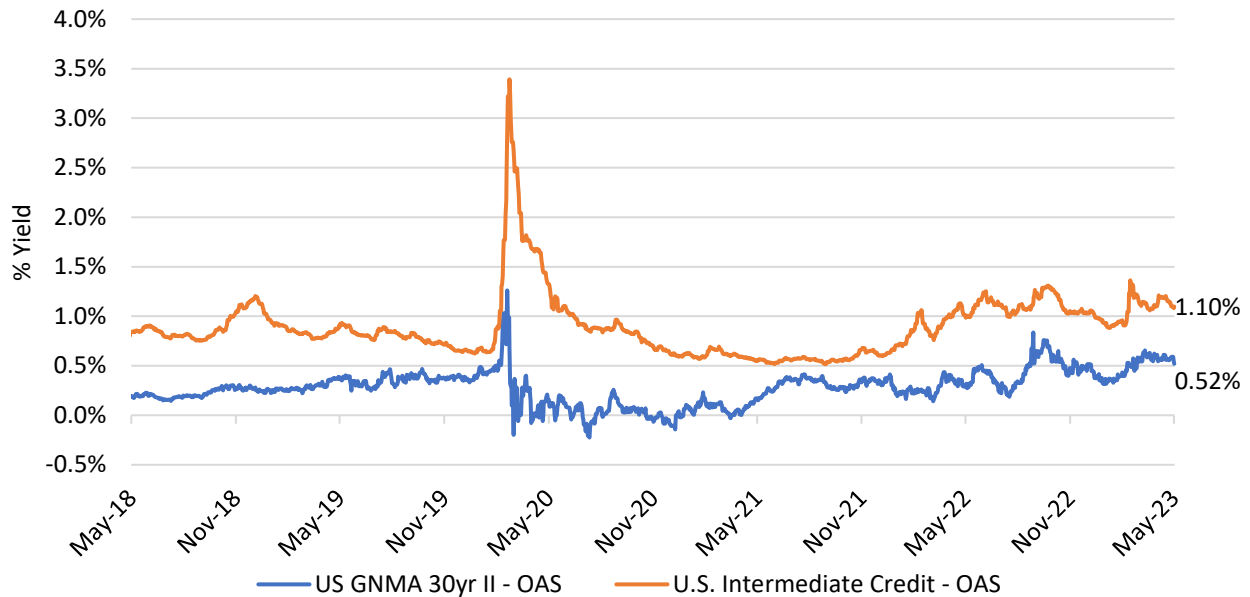


Figure 11. Spread between US Intermediate Credit and US GNMA II 30yr MBS OAS

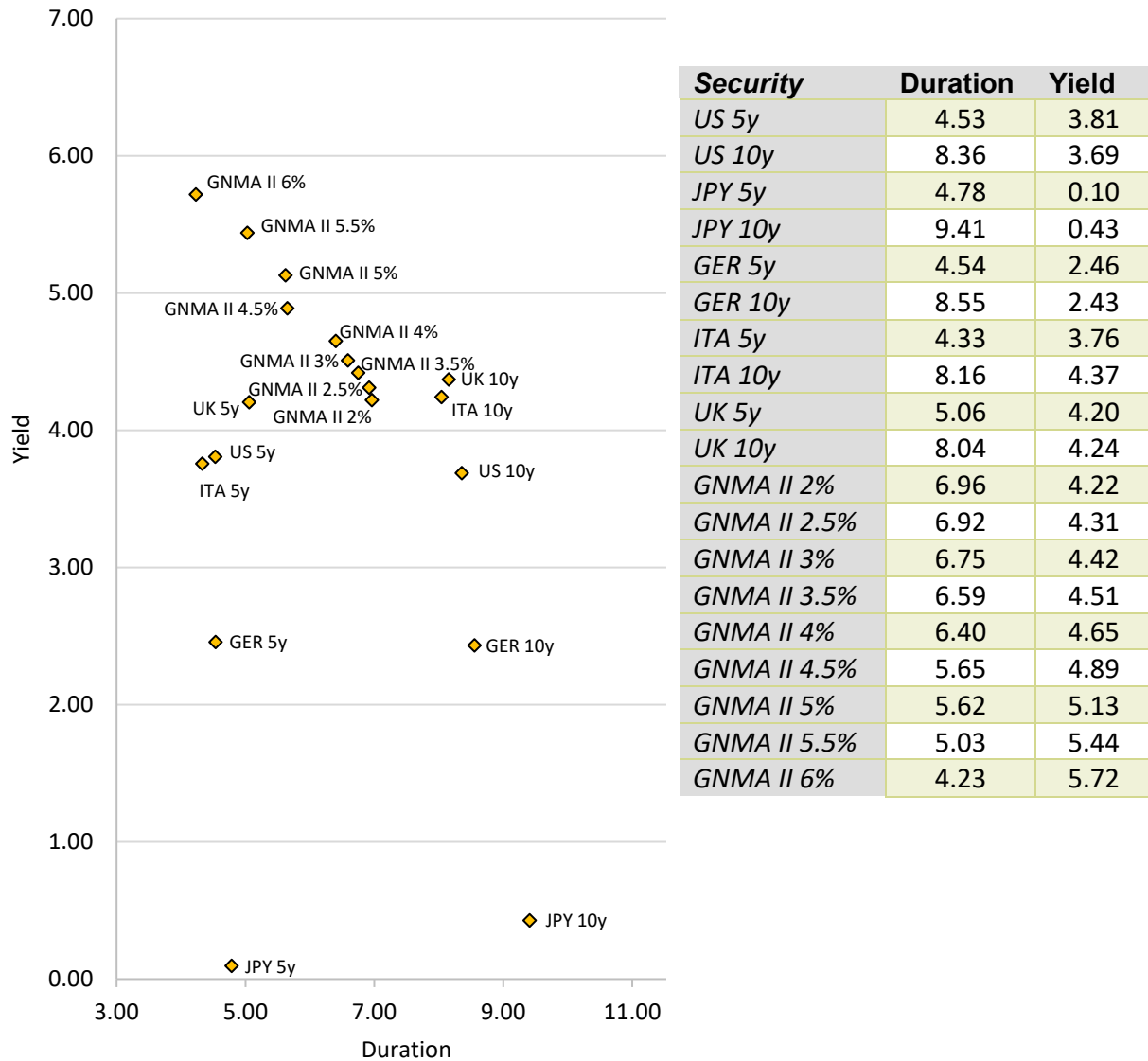


Source: Bloomberg. Note: Data as of May 2023.

3.4 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.

Figure 12. 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 May 2023. Yields are in base currency of security and unhedged.

4 PREPAYMENTS

4.1 Aggregate Prepayments (CPR)

Ginnie Mae fixed rate aggregate prepayment speeds increased in May 2023 by 19.3% MoM. Likewise, Fannie Mae and Freddie Mac CPRs increased 20.6% and 21.5%, respectively. ARM prepayments increased for GSEs and decreased for Ginnie Mae MoM.

Figure 13. Fixed Rate Aggregate 1-Month CPR

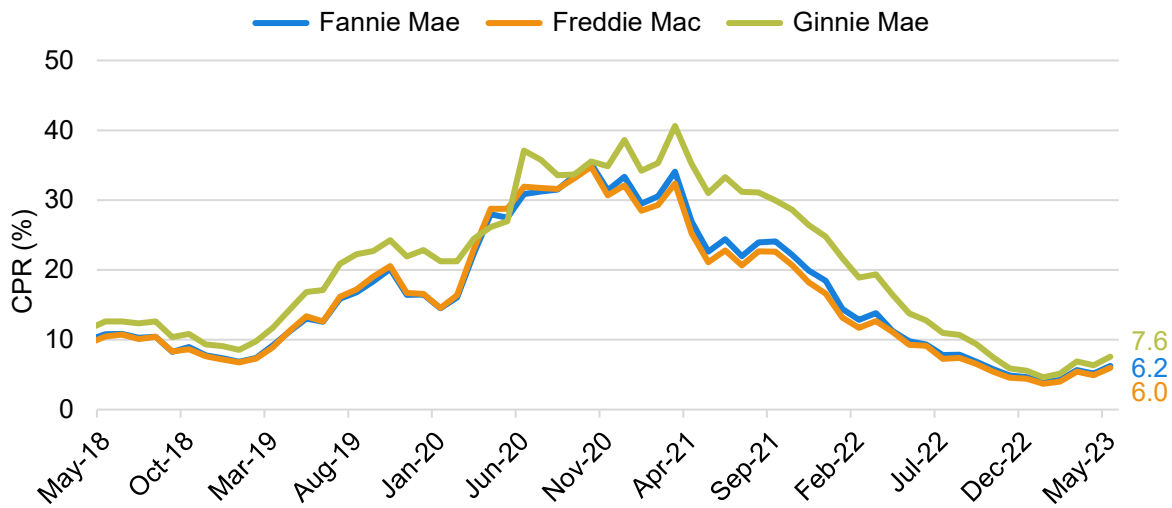
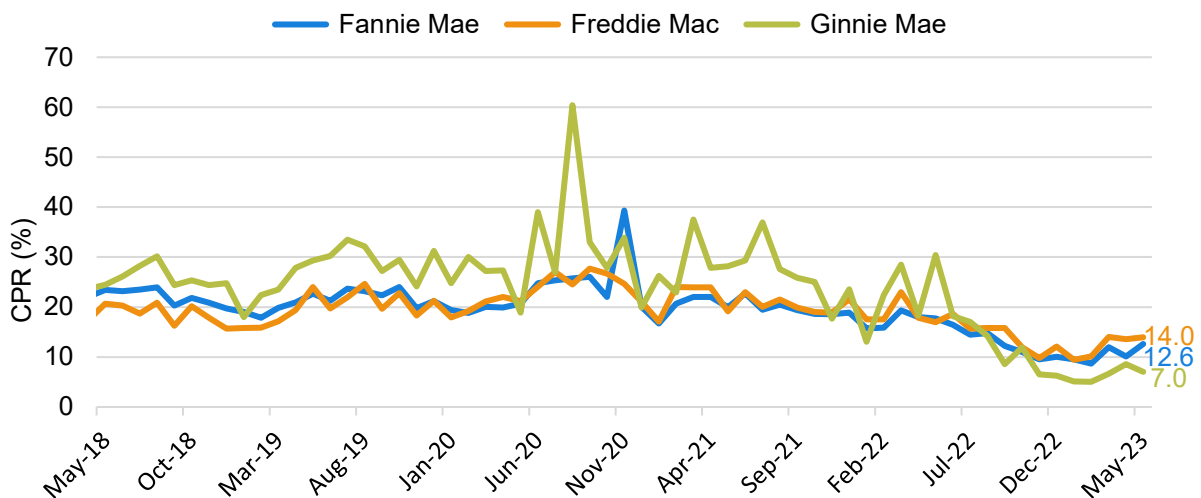


Figure 14. ARM Aggregate 1-Month CPR



Source: Recursion. Note: Data as of May 2023.

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 as of month-end May 2023 after slightly overtaking Ginnie Mae in September 2022.

Figure 15. Fixed Rate Aggregate CDR

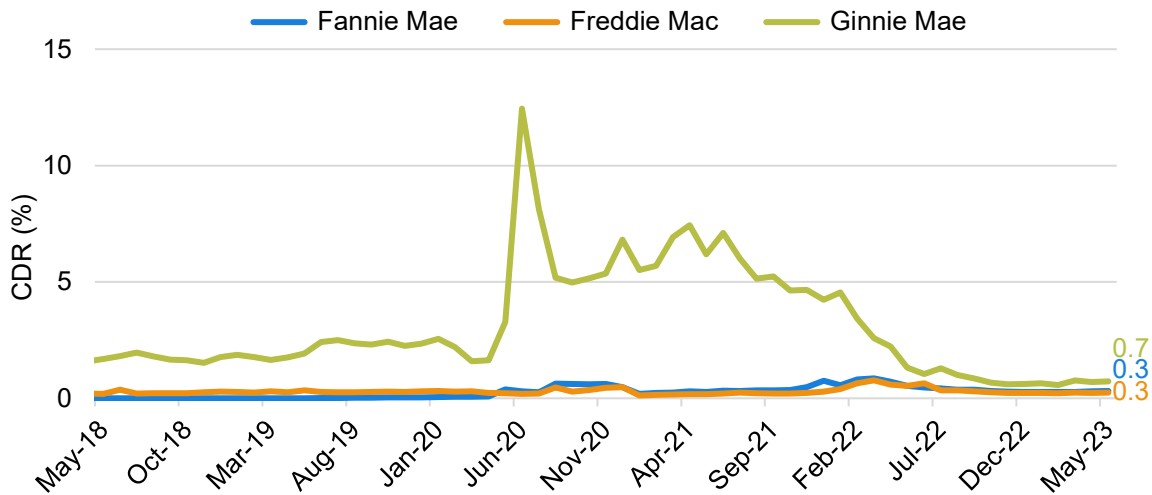
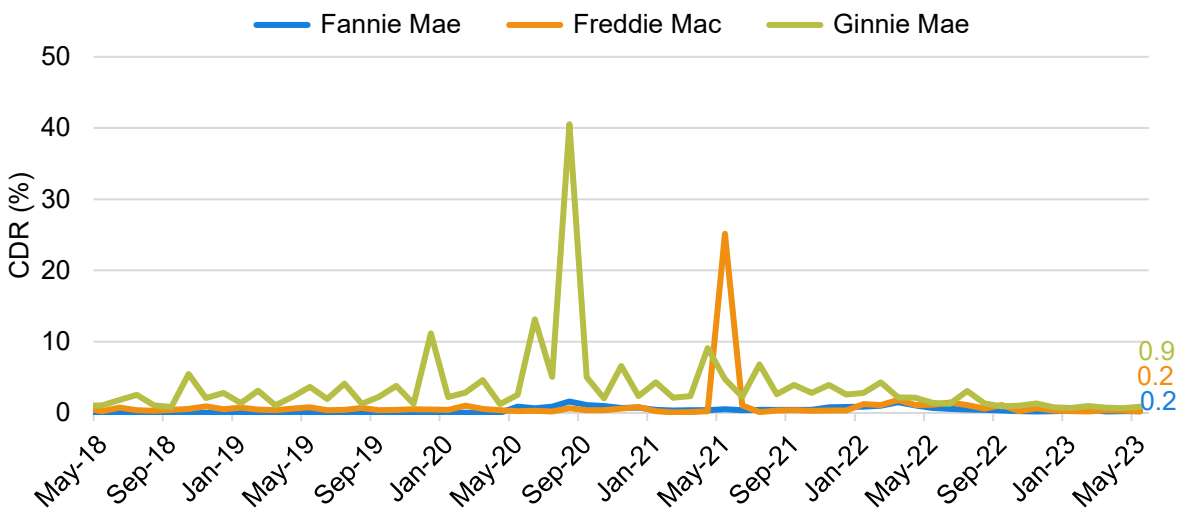


Figure 16. ARM Aggregate CDR



Source: Recursion. Note: Data as of May 2023.

4.3 Voluntary Prepayment Rates (CRR)

Fixed rate voluntary prepayments (CRR) continue to remain higher for Ginnie Mae relative to the GSEs. Fannie Mae and Freddie Mac saw increases of 21.8% MoM and 22.1% MoM in fixed rate aggregate CRR, respectively. Freddie Mac saw a 3.7% MoM increase and Fannie Mae saw a 25.2% MoM increase in ARM aggregate CRR. Ginnie Mae increased 21.0% MoM in fixed rate aggregate CRR and saw a 21.7% MoM decrease in ARM aggregate CRR.

Figure 17. Fixed Rate Aggregate CRR

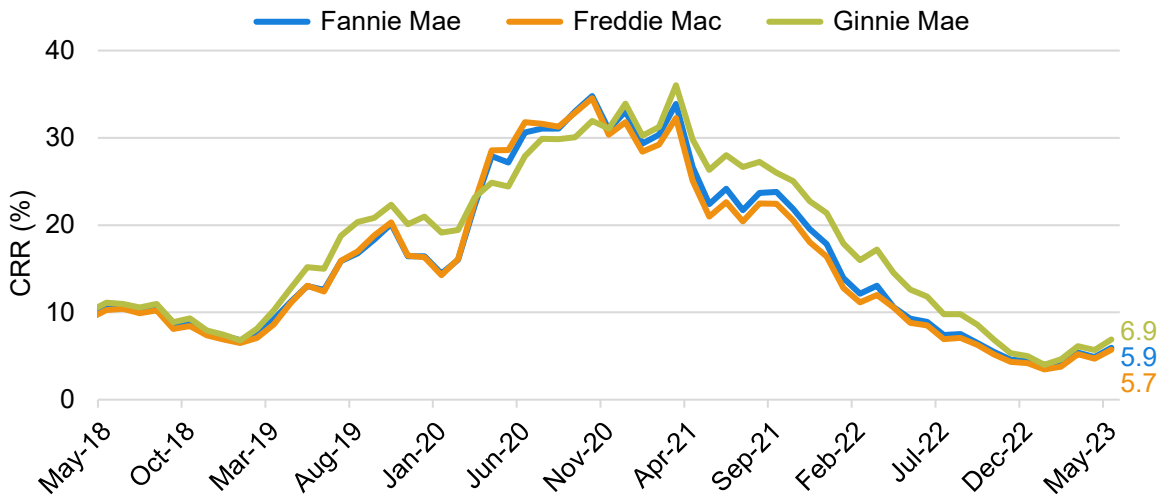
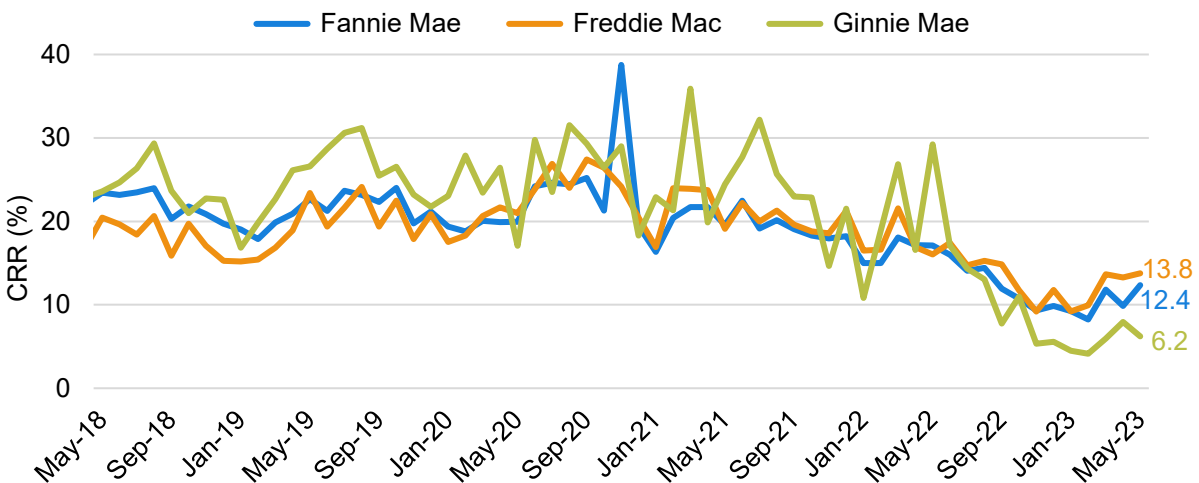


Figure 18. ARM Aggregate CRR



Source: Recursion. Note: Data as of May 2023.

5 SINGLE-FAMILY MBS PASS-THROUGH ISSUANCE

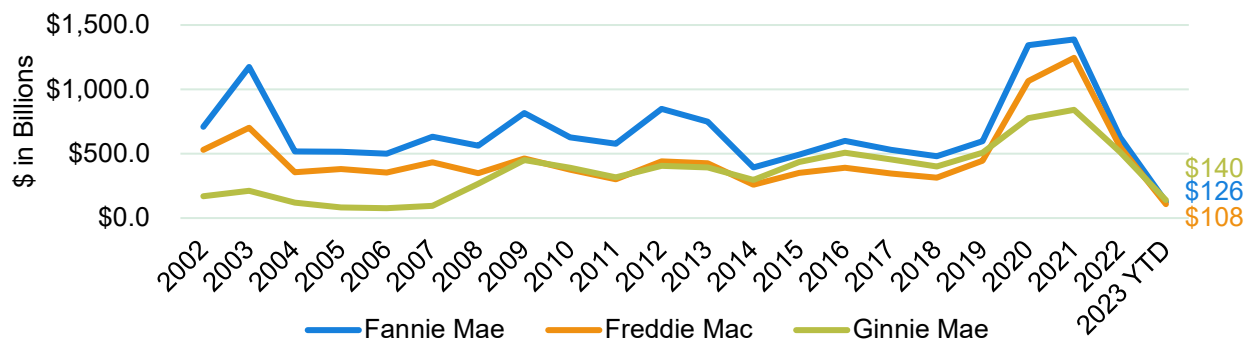
5.1 Gross Issuance of Agency MBS

Agency gross MBS issuance increased by 15% MoM. Freddie Mac, Ginnie Mae, and Fannie Mae all saw increases in gross issuance compared to April 2023 as seen in [Section 5.3](#).

Table 3. 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	\$628.3	\$551.6	\$1,179.9	\$512.3	\$1,692.2
2023 YTD	\$126.4	\$108.0	\$234.4	\$140.3	\$374.7

Figure 19. Agency Gross Issuance

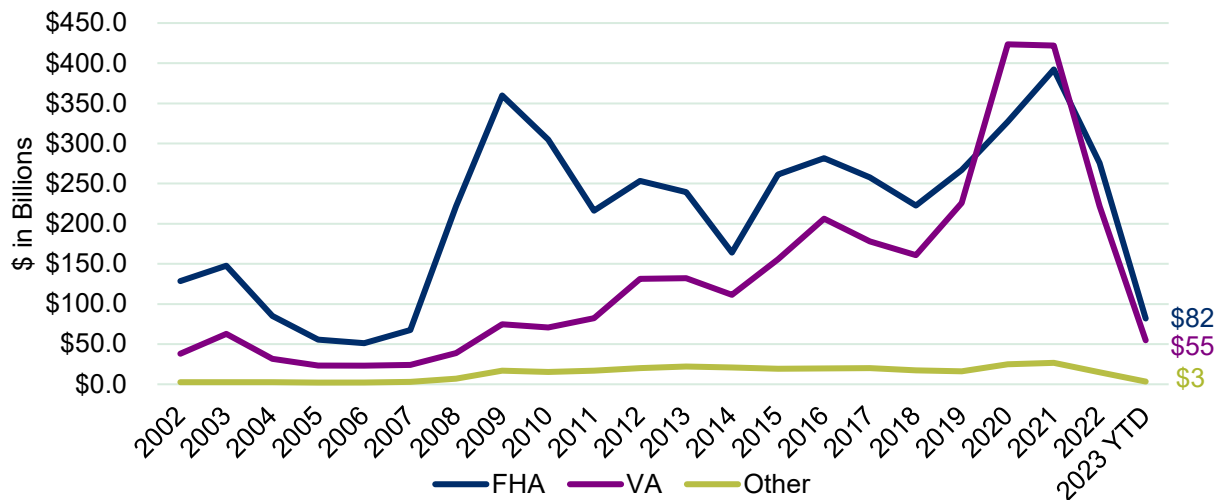


Note: Numbers are rounded to the nearest hundred million. For sums, like "GSE Total", the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

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

Issuance Year	FHA	VA	Other	Total
2001	\$133.8	\$34.7	\$3.1	\$171.5
2002	\$128.6	\$37.9	\$2.5	\$169.0
2003	\$147.9	\$62.7	\$2.5	\$213.1
2004	\$85.0	\$31.8	\$2.5	\$119.2
2005	\$55.7	\$23.5	\$2.1	\$81.4
2006	\$51.2	\$23.2	\$2.3	\$76.7
2007	\$67.7	\$24.2	\$3.0	\$94.9
2008	\$221.7	\$39.0	\$6.9	\$267.6
2009	\$359.9	\$74.6	\$16.8	\$451.3
2010	\$304.9	\$70.6	\$15.3	\$390.7
2011	\$216.1	\$82.3	\$16.9	\$315.3
2012	\$253.4	\$131.3	\$20.3	\$405.0
2013	\$239.2	\$132.2	\$22.2	\$393.6
2014	\$163.9	\$111.4	\$21.0	\$296.3
2015	\$261.5	\$155.6	\$19.2	\$436.3
2016	\$281.8	\$206.5	\$19.9	\$508.2
2017	\$257.6	\$177.8	\$20.2	\$455.6
2018	\$222.6	\$160.8	\$17.2	\$400.6
2019	\$266.9	\$225.7	\$16.0	\$508.6
2020	\$327.0	\$423.5	\$24.9	\$775.4
2021	\$392.2	\$422.1	\$26.7	\$840.9
2022	\$275.8	\$221.7	\$14.8	\$512.3
2023 YTD	\$82.1	\$54.8	\$3.3	\$140.2

Figure 20. Ginnie Mae Gross Issuance



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.

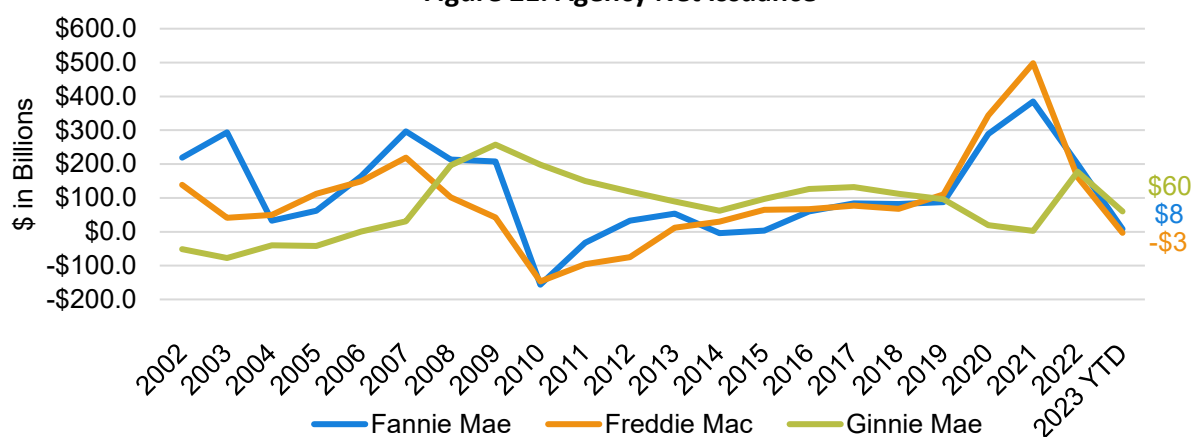
5.2 Net Issuance of Agency MBS

Agency net issuance as of month-end May was approximately \$20.1 billion, which represents an 18% MoM increase. Ginnie Mae net issuance was \$13.5 billion as of month-end May, a 10% decrease from April 2023. Since May 2022, FHA net issuance continues to outpace VA net issuance MoM, as shown in **Table 6 and Figure 22**.

Table 5. Agency Net Issuance (\$ in billions)

Issuance Year	Fannie Mae	Freddie Mac	GSE	Ginnie Mae	Total
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	\$200.4	\$161.5	\$361.9	\$177.4	\$539.4
2023 YTD	\$8.2	-\$3.4	\$4.8	\$60.0	\$64.8

Figure 21. Agency Net Issuance

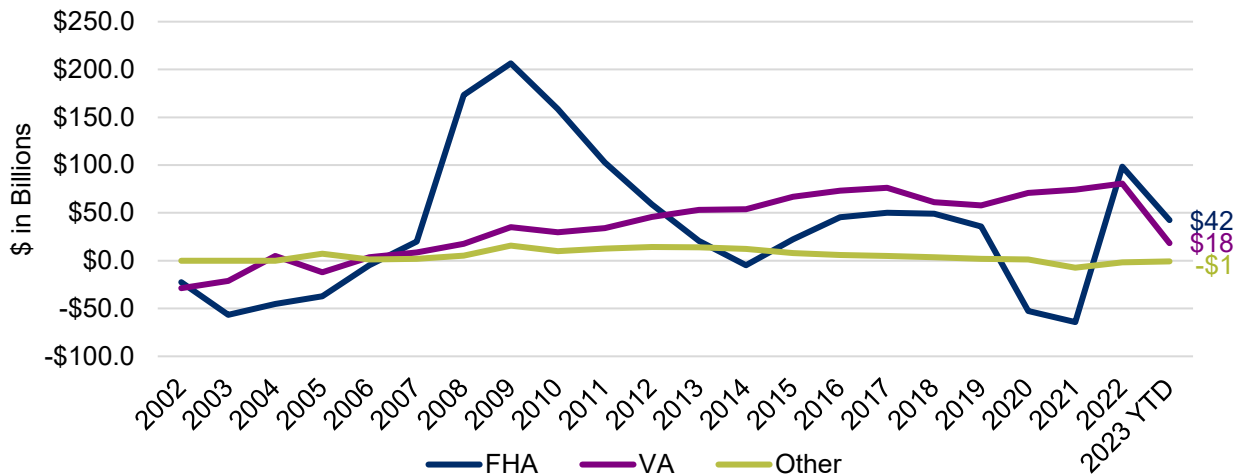


Note: Numbers are rounded to the nearest hundred million. For sums, like "GSE Total", the values are rounded after the exact underlying values are summed. As a result, some sums may not appear to match the sum of their rounded component values.

Table 6. Ginnie Mae Net Issuance Collateral Composition (\$ in billions)

Issuance Year	FHA	VA	Other	Total
2000	\$29.0	\$0.3	\$0.0	\$29.3
2001	\$0.7	-\$10.6	\$0.0	-\$9.9
2002	-\$22.5	-\$28.7	\$0.0	-\$51.2
2003	-\$56.5	-\$21.1	\$0.0	-\$77.6
2004	-\$45.2	\$5.1	\$0.0	-\$40.1
2005	-\$37.3	-\$12.1	\$7.2	-\$42.2
2006	-\$4.7	\$3.8	\$1.2	\$0.2
2007	\$20.2	\$8.7	\$2.0	\$30.9
2008	\$173.3	\$17.7	\$5.4	\$196.4
2009	\$206.4	\$35.1	\$15.8	\$257.4
2010	\$158.6	\$29.6	\$10.0	\$198.3
2011	\$102.8	\$34.0	\$12.8	\$149.6
2012	\$58.9	\$45.9	\$14.3	\$119.1
2013	\$20.7	\$53.3	\$13.9	\$87.9
2014	-\$4.8	\$53.9	\$12.5	\$61.6
2015	\$22.5	\$66.9	\$7.9	\$97.3
2016	\$45.6	\$73.2	\$6.0	\$124.9
2017	\$50.1	\$76.1	\$5.0	\$131.2
2018	\$49.2	\$61.2	\$3.5	\$113.9
2019	\$35.9	\$58.0	\$1.9	\$95.7
2020	-\$52.5	\$71.0	\$1.3	\$19.9
2021	-\$64.2	\$74.2	-\$7.3	\$2.7
2022	\$98.5	\$80.7	-\$1.7	\$177.4
2023 YTD	\$42.4	\$18.2	-\$0.6	\$60.0

Figure 22. Ginnie Mae Net Issuance



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

Ginnie Mae's \$32.6 billion in gross issuance as of month-end May, seen in **Table 7**, was approximately 24% below the average monthly issuance for 2022.

Table 7. 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
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
Dec-22	\$24.9	\$25.5	\$28.8	\$50.4	\$79.2	\$0.2	\$6.6	\$14.0	\$6.8	\$20.8
Jan-23	\$25.7	\$22.4	\$27.1	\$48.1	\$75.2	\$5.3	\$3.4	\$14.1	\$8.7	\$22.8
Feb-23	\$18.9	\$16.5	\$22.7	\$35.4	\$58.1	-\$4.4	-\$1.4	\$8.6	-\$5.8	\$2.8
Mar-23	\$23.6	\$19.2	\$26.2	\$42.8	\$69.0	-\$4.4	-\$2.4	\$8.7	-\$6.8	\$1.9
Apr-23	\$27.7	\$21.0	\$31.6	\$48.7	\$80.3	\$1.4	\$0.6	\$15.0	\$2.0	\$17.0
May-23	\$30.4	\$29.0	\$32.6	\$59.4	\$92.0	\$0.6	\$6.0	\$13.5	\$6.6	\$20.1

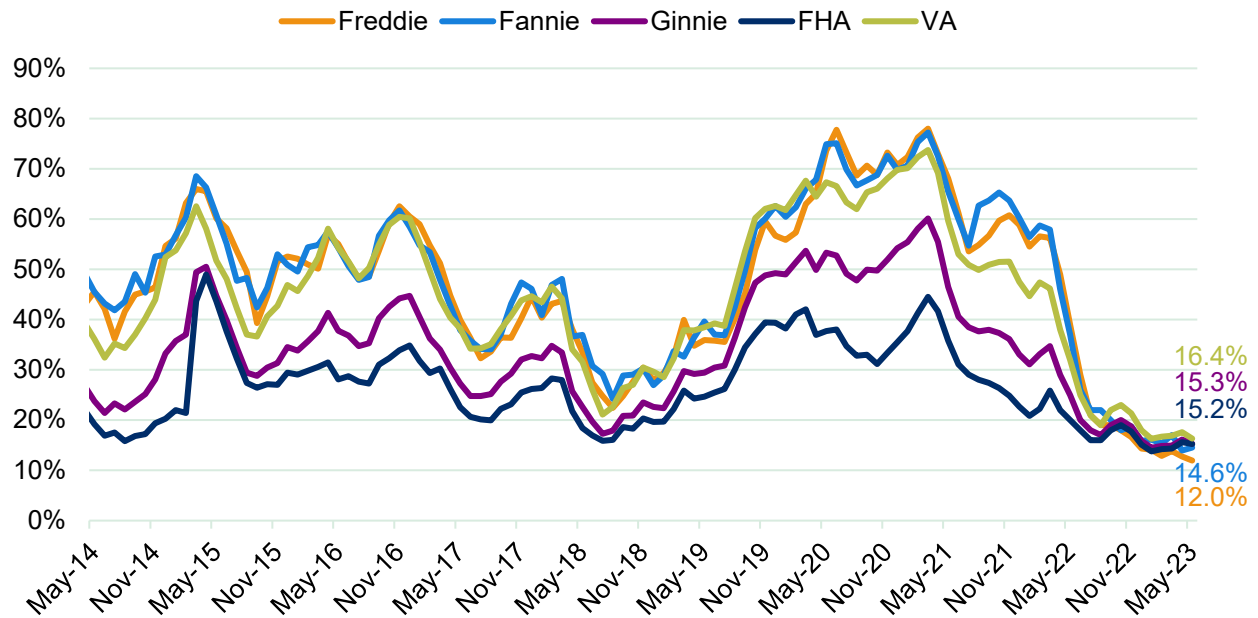
Source: Beginning May 2021, data for Gross and Net Issuance was sourced from Fannie Mae, Freddie Mac, and Ginnie Mae loan level disclosure files. Net issuance is defined here as the difference between prior period UPB and current period UPB. Data as of May 2023. Beginning with the October 2021 GMAR, the Fannie Mae and Freddie Mac net issuance data have been updated to reflect the current UPB of the portfolios. July 2021 through May 2023 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 decreased for Ginnie Mae as of month-end May 2023. Ginnie Mae’s MoM decrease was approximately 4.8%, with a greater decrease taking place with VA lending which was down approximately 7.0% in May MoM. FHA’s refinance share decreased by approximately 2.6%. In the conventional conforming mortgage market space, Fannie Mae saw an increase of 4.3% MoM and Freddie Mac saw a decrease of 6.5% MoM.

- Freddie Mac’s refinance percentage dropped to 12.0% in May, down from 12.8% in April.
- Fannie Mae’s refinance percentage rose to 14.6% in May, up from 14.0% in April.
- Ginnie Mae’s refinance percentage dropped to 15.3% in May, down from 16.1% in April.
- FHA’s refinance percentage dropped to 15.2% in May, down from 15.6% in April.
- VA’s refinance percentage dropped to 16.4% in May, down from 17.6% in April.

Figure 23. Percent Refinance at Issuance – Single-Family



Sources: Recursion. Note: Data as of May 2023.

6 AGENCY SINGLE-FAMILY MBS OUTSTANDING

6.1 Outstanding Single-Family Agency MBS

As of month-end May 2023, outstanding single-family MBS in the agency market totaled \$8.668 trillion: 41.2% Fannie Mae, 33.5% Freddie Mac, and 25.3% Ginnie Mae MBS. Over the past twelve months, Fannie Mae’s, Freddie Mac’s, and Ginnie Mae’s total outstanding MBS increased by approximately 1.2%, 2.9%, and 8.8%, respectively. Fannie Mae outstanding MBS remains larger than Freddie Mac’s and Ginnie Mae’s by approximately \$667 billion and \$1.4 trillion, respectively.

Ginnie Mae MBS collateral composition has changed dramatically over the past five years. In May 2018, 60.3% of Ginnie Mae outstanding collateral was FHA and 33.5% was VA. As of month-end May 2023, FHA collateral comprised 53.3% of Ginnie Mae MBS outstanding, and VA collateral comprised 41.9% of Ginnie Mae MBS outstanding.

Figure 24. Outstanding Agency Mortgage-Backed Securities

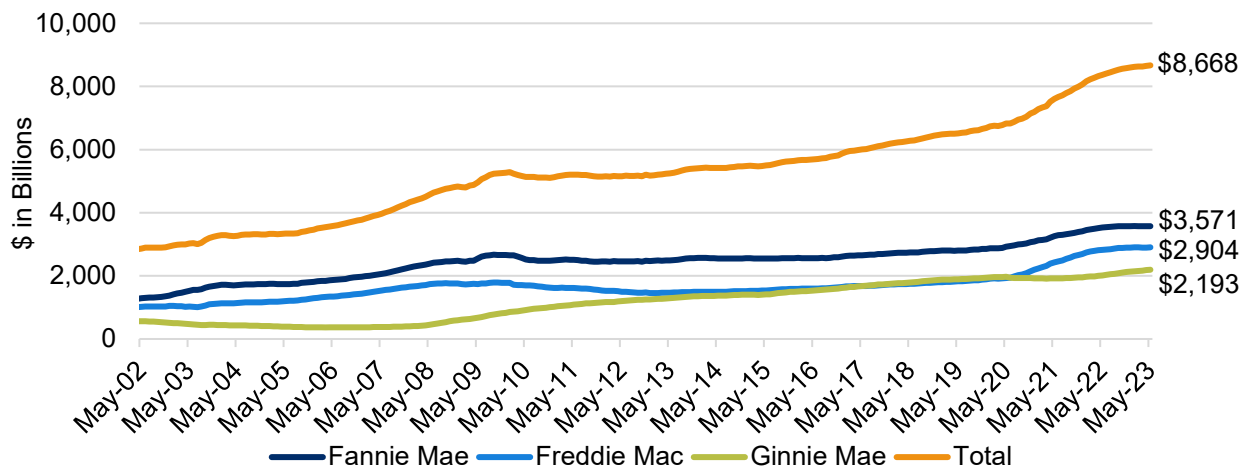
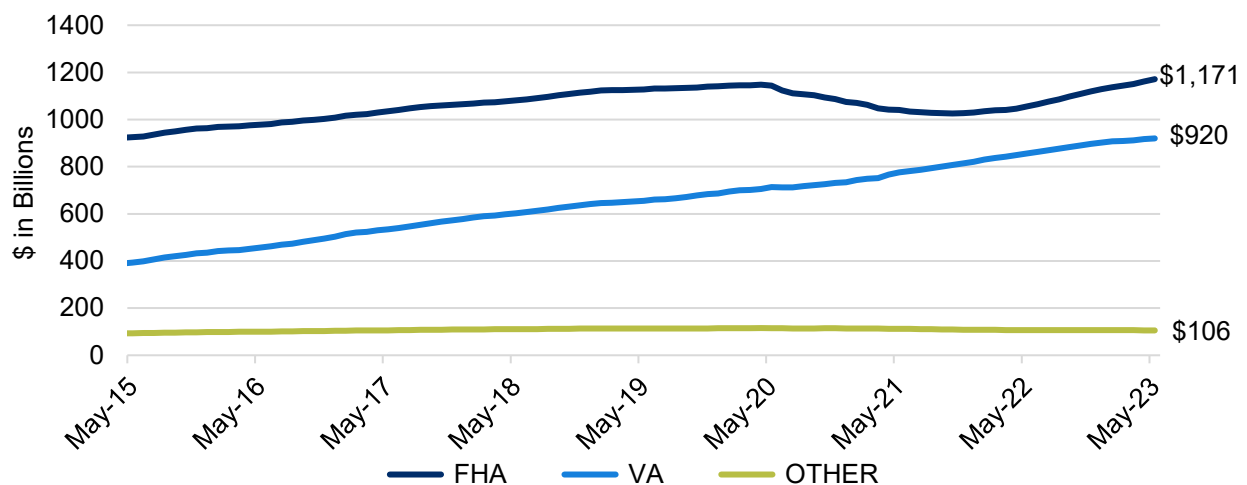


Figure 25. Composition of Outstanding Ginnie Mae Mortgage-Backed Securities



Sources: Recursion. Note: Data as of May 2023.

6.2 Origination Volume and Share Over Time

First lien origination volume continued to decline in Q1 2023, with \$290 billion in originations, which represents a decline in issuance from Q4 2022 of approximately 13%. Ginnie Mae’s share of total origination decreased from 25.6% to 22.3% in Q1 2023, while portfolio origination increased from 25.3% to 31.1% in Q1 2023.

Figure 26. First Lien Origination Volume

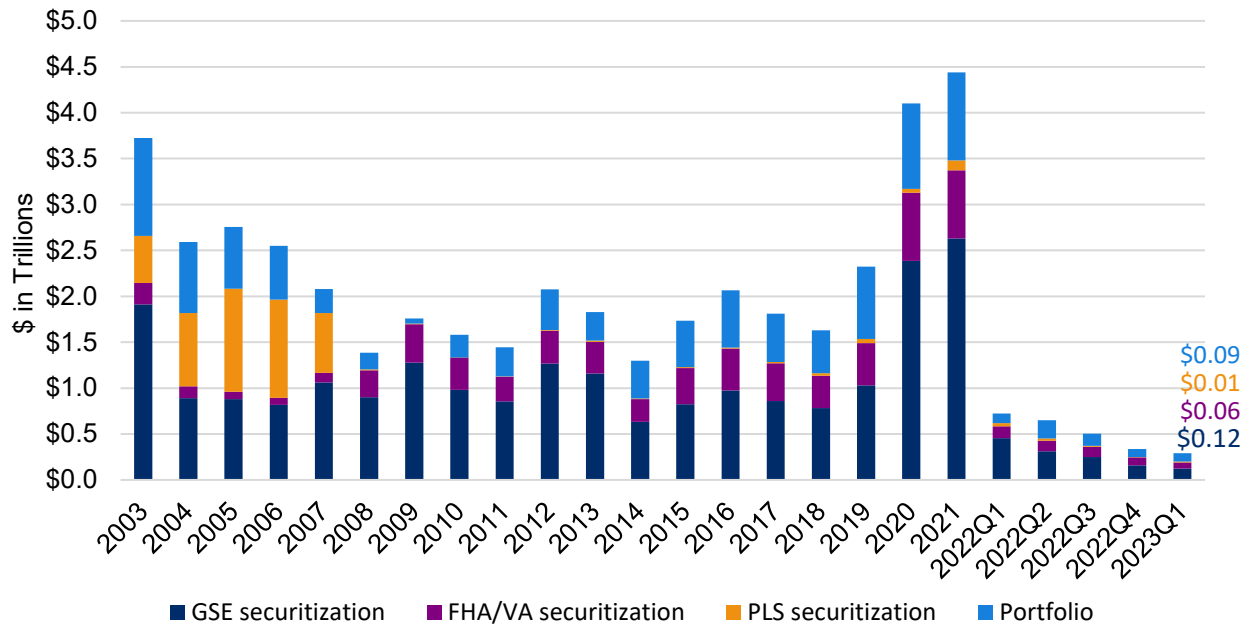
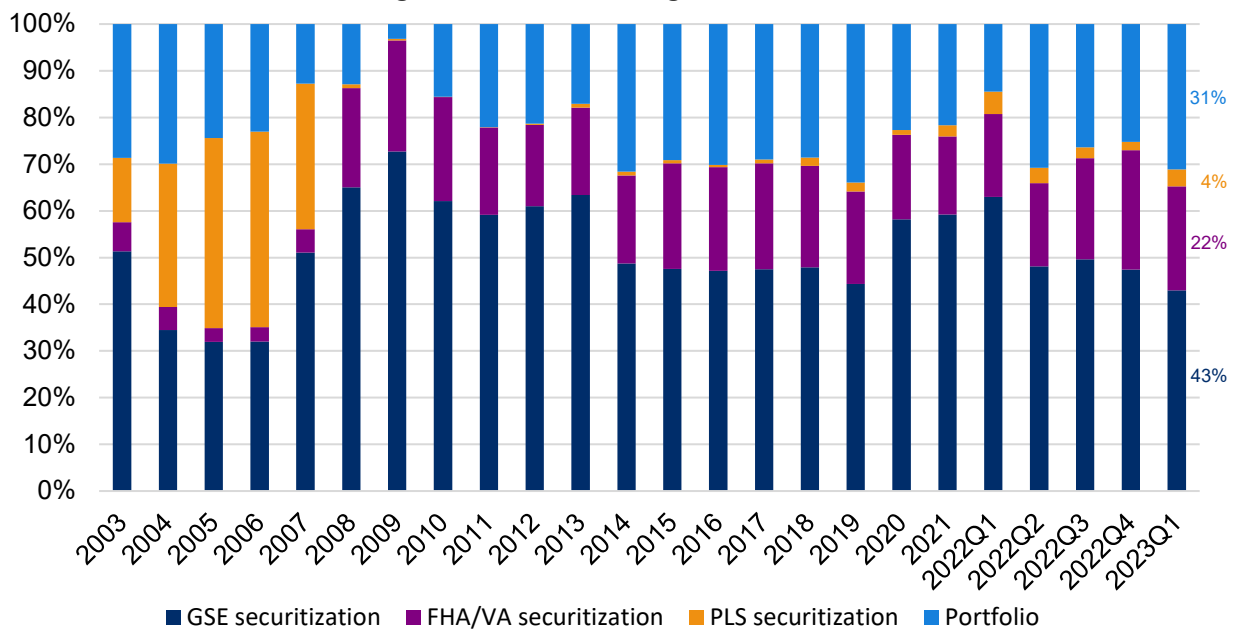


Figure 27. First Lien Origination Share



Source: Inside Mortgage Finance. Note: Data as of Q1 2023.

6.3 Agency Issuance and Agency Outstanding by State

Ginnie Mae MBS represent approximately 34% of new agency issuance over the past year, roughly 8% higher than Ginnie Mae’s 26% share of agency outstanding. The share of Ginnie Mae’s new agency issuance varies across states, with the highest Ginnie Mae share being in Alaska (56%) and the lowest in the District of Columbia (22%). The highest Ginnie Mae outstanding share is also in Alaska (48%) and the lowest in the District of Columbia (13%).

Table 8. 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)
	34%	1,762,567	285.55	294.37	26%	10,842,486	206.25	210.92
AK	56%	5,529	341.11	304.59	48%	37,513	261.94	220.41
AL	48%	41,281	227.87	241.81	41%	239,366	158.77	177.93
AR	44%	21,404	195.51	225.76	39%	137,674	133.68	161.32
AZ	33%	52,073	324.74	331.65	25%	278,064	222.87	226.98
CA	29%	110,146	451.41	447.01	17%	692,413	329.98	320.03
CO	32%	38,293	407.48	398.18	24%	215,516	294.80	278.26
CT	33%	15,863	267.91	278.90	26%	107,072	202.99	208.88
DC	22%	1,382	493.78	424.58	13%	9,041	384.36	348.88
DE	36%	8,137	274.76	302.23	31%	52,509	205.36	211.91
FL	37%	160,950	305.82	304.83	32%	863,114	215.47	213.21
GA	41%	94,747	263.55	296.62	34%	504,263	182.95	207.84
HI	44%	4,788	620.52	506.23	32%	33,768	470.27	357.76
IA	32%	12,619	184.42	197.95	22%	83,088	134.88	148.14
ID	31%	10,419	337.13	328.31	23%	64,313	221.53	223.85
IL	29%	57,859	212.22	246.08	22%	370,770	160.70	179.06
IN	36%	46,529	195.24	216.09	30%	281,594	135.68	151.38
KS	35%	14,769	196.16	226.69	29%	96,656	141.02	163.91
KY	43%	27,993	201.46	218.12	35%	166,455	144.97	156.09
LA	49%	33,550	207.62	238.56	40%	203,265	158.51	177.36
MA	28%	17,364	379.59	372.88	16%	114,752	285.92	267.95
MD	43%	44,556	341.35	331.23	34%	294,683	266.03	249.22
ME	34%	5,887	250.06	274.93	26%	38,206	178.87	191.80
MI	27%	43,437	188.57	216.93	20%	277,846	134.83	156.73
MN	23%	21,189	251.72	280.74	18%	160,196	182.97	198.32
MO	36%	38,959	201.62	223.40	29%	246,186	143.32	162.23
MS	55%	20,366	205.64	220.63	48%	123,533	145.07	161.28
MT	29%	4,524	314.97	318.78	24%	32,403	210.71	216.63
NC	35%	73,569	259.33	292.83	29%	418,164	178.55	203.14
ND	35%	2,593	247.27	240.76	24%	17,105	193.63	183.55
NE	33%	9,212	223.73	227.21	27%	65,157	150.77	161.11
NH	29%	5,430	320.17	312.69	22%	38,453	227.70	215.00
NJ	30%	37,212	323.54	338.07	22%	234,117	242.04	254.20
NM	44%	14,530	247.94	257.72	38%	95,884	168.70	178.72
NV	37%	23,733	350.86	339.58	30%	134,740	250.86	236.43
NY	26%	40,219	299.53	340.01	20%	309,447	210.71	248.27
OH	35%	64,747	187.75	204.37	29%	426,796	131.45	149.32
OK	44%	28,363	206.12	227.50	42%	189,953	142.49	162.91
OR	25%	16,982	357.33	367.42	19%	111,362	255.89	253.78
PA	29%	53,182	203.90	249.14	26%	391,165	149.62	182.03
RI	42%	5,605	333.16	304.10	30%	35,997	236.12	212.79
SC	41%	45,545	258.11	266.49	34%	238,294	185.75	192.95
SD	36%	4,375	247.19	248.59	29%	29,365	174.18	177.42
TN	36%	48,114	264.17	286.84	31%	271,911	178.49	205.40
TX	33%	178,476	274.47	309.29	32%	1,107,798	185.46	214.25
UT	26%	16,531	384.80	392.63	19%	96,473	264.23	264.85
VA	46%	70,176	334.49	326.23	36%	449,634	258.06	250.01
VI	24%	115	353.71	424.67	24%	806	253.51	303.64
VT	25%	1,681	243.48	266.48	19%	12,219	181.87	180.55
WA	29%	35,423	404.70	411.85	21%	233,497	287.08	289.87
WI	26%	18,537	213.79	231.08	17%	124,513	157.35	163.02
WV	51%	9,723	196.34	197.57	44%	60,321	145.06	145.33
WY	41%	3,881	270.56	270.59	35%	25,056	206.69	201.69

Source: Recursion. Note: Outstanding balance is based on loan balance as of May 2023. Ginnie Mae issuance is based on the last 12 months, from April 2022 to May 2023. Values above are based on loan level disclosure data, thus excluding loan balances for the first 6 months that loans are in a pool. This accounts for the difference in share of outstanding MBS represented above & in [Outstanding Single-Family Agency MBS](#).

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

As of month-end May 2023, the weighted average coupon (WAC) on outstanding Ginnie Mae MBS increased slightly from 3.21% in April 2023 to 3.25% as seen in **Figure 28**. **Figure 29** illustrates that loans originated since 2019 account for 79% of Ginnie Mae MBS collateral outstanding.

Figure 28. Outstanding Ginnie Mae MBS Balance, by Coupon

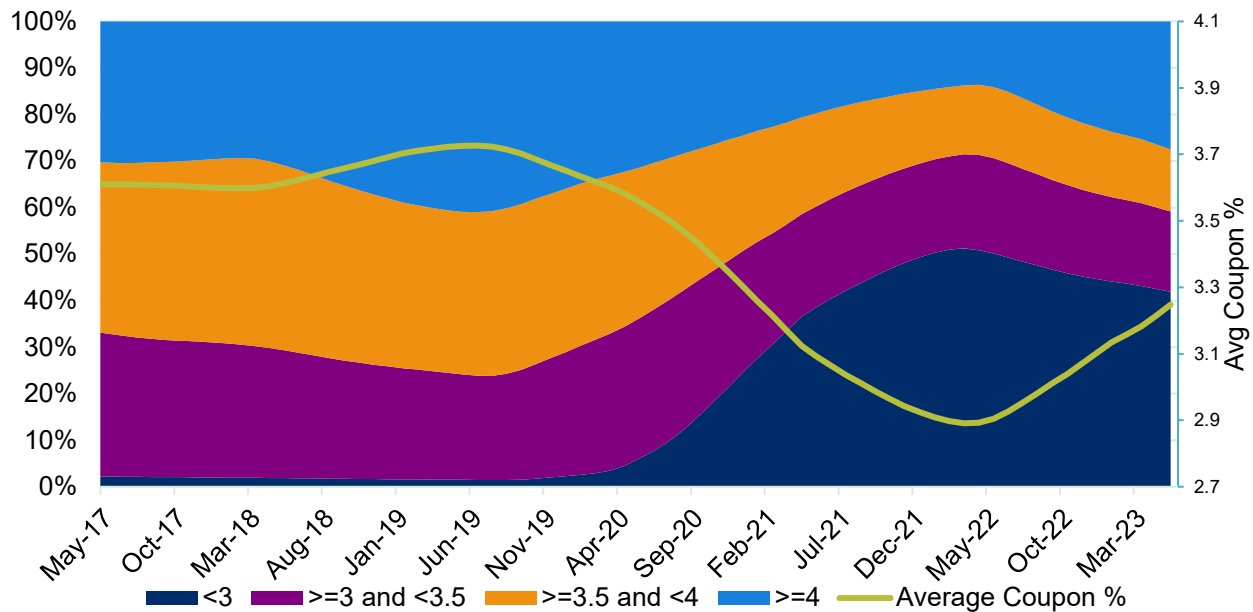
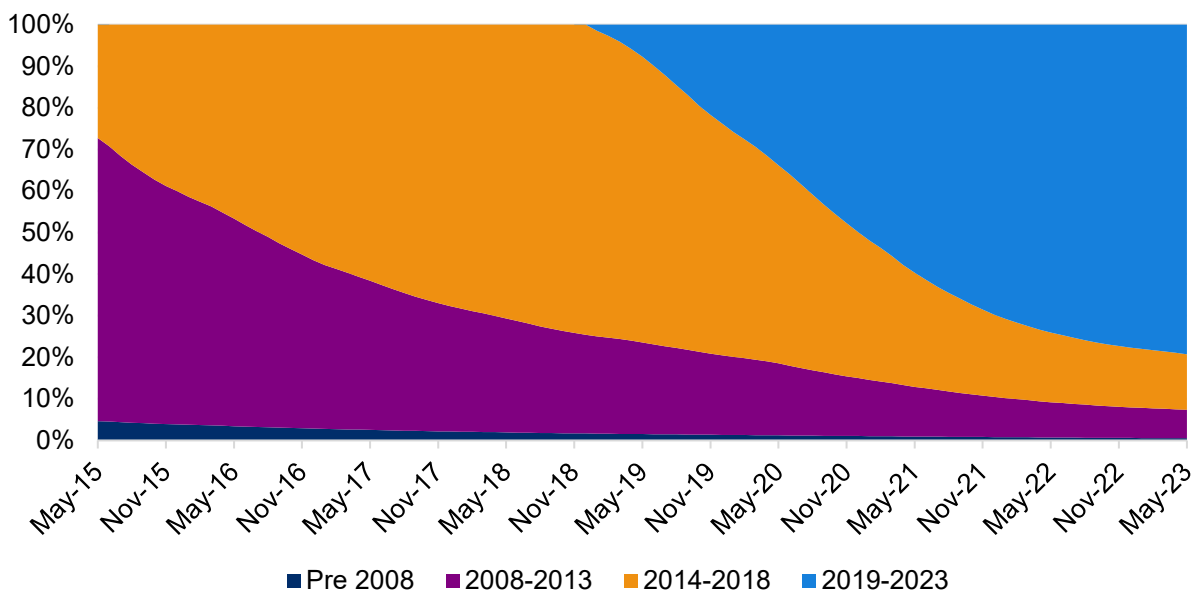


Figure 29. Outstanding Ginnie Mae MBS Balance, by Vintage



Sources: Recursion. Note: May 2023 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

As of month-end May 2023, \$9.9 billion of Ginnie Mae MBS were securitized into Real Estate Mortgage Investment Conduits (REMICs) as underlying collateral. This represents a roughly 59.6% increase YoY from \$5.9 billion in May 2022, and a 56.5% MoM increase from \$5.6 billion in April 2023. Of that, approximately \$104.6 million were multifamily MBS having coupons over 4.01%. \$9.0 billion were single-family MBS having coupons over 5.01%.

Figure 30. Ginnie Mae Single-Family and Multifamily MBS Securitized into REMICs

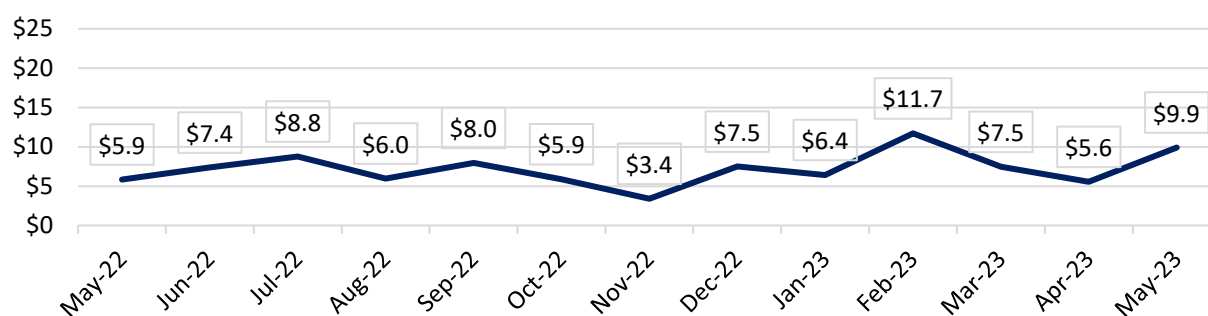


Table 9. May 2023 REMIC Collateral Coupon Distribution

Net Coupon (%)	Approx. Ginnie Mae MBS amount securitized into REMIC Deals (\$MM) ⁴	% Breakdown of REMIC Collateral by coupon
Multifamily		
3.01-3.50	272.0	39.2%
3.51-4.00	317.7	45.8%
4.51-5.00	104.6	15.1%
Subtotal	694.3	100.0%
Single-Family		
<2.01	0.0	0.0%
3.51-4.00	39.1	0.4%
4.01-4.50	103.4	1.1%
4.51-5.00	73.6	0.8%
5.01-5.50	578.6	6.3%
5.51-6.00	5,527.4	59.9%
6.01-6.50	2,834.5	30.7%
6.51-7.00	73.7	0.8%
Subtotal	9,230.3	100.0%
Grand Total	9,924.6	100.0%

Source: Ginnie Mae Disclosure Files

⁴Totals may not sum due to rounding.

7.2 REMIC Market Snapshot

- In May 2023, Ginnie Mae saw its largest average deal size since July 2022. Ginnie Mae’s average deal size in May was \$581 million.
- In May 2023, Ginnie Mae, Fannie Mae, and Freddie Mac all had a total issuance increase. It is the second time in 2023 that this has occurred; the previous occurrence was in February of this year.
- In May 2023, Ginnie Mae had a Monthly YoY increase of unpaid principal balance of 58%. This is the first month to feature a Monthly YoY increase in unpaid principal balance since February 2022.
- In May 2023, Freddie Mac issued sixteen deals, its highest total since September 2022.

Figure 31. REMIC Issuance by Agency

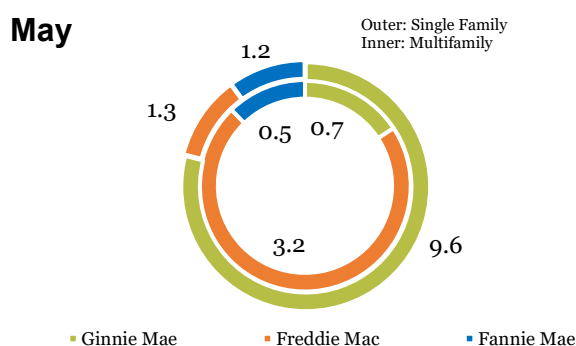


Table 10. Monthly REMIC Issuance by Agency

	SF REMIC Issuance Volume (\$B)	% of SF REMIC Issuance Volume	Number of SF REMIC Transactions	MF REMIC Issuance Volume (\$B)	% of MF REMIC Issuance Volume	Number of MF REMIC Transactions
Ginnie Mae	9.6	79.0	10	0.7	15.8	6
Freddie Mac	1.3	11.0	10	3.2	71.9	6
Fannie Mae	1.2	10.0	6	0.5	12.2	1
Total⁵	\$12.2	100%	26	\$4.4	100%	13

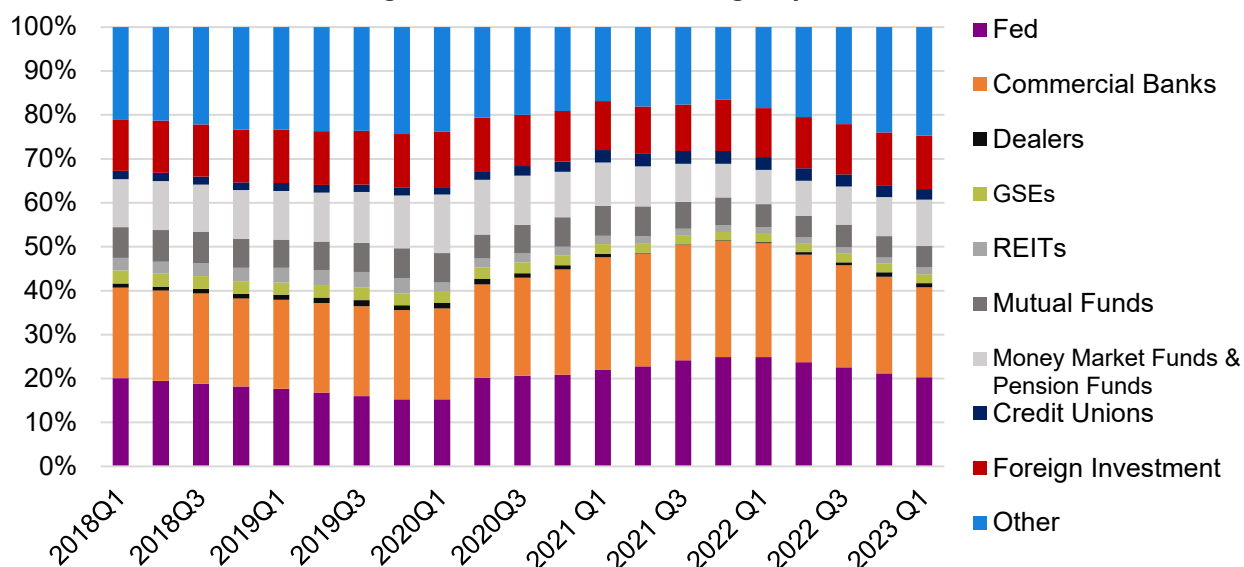
Source: Ginnie Mae Disclosure Files

⁵ Totals may not sum due to rounding.

8 MBS OWNERSHIP

As of Q1 2023, the largest holders of agency debt (agency MBS + agency notes and bonds) included commercial banks (20%), the Federal Reserve (20%), and foreign investors (12%). The Federal Reserve’s share decreased slightly to 20% in the first quarter of 2023 from 21% in the fourth quarter of 2022. Along with the Federal Reserve, commercial banks are one of the largest holders of agency MBS. Out of the approximately \$2.7 trillion in holdings as of the end of March 2023, \$2.0 trillion was held by the top 25 domestic banks.

Figure 32. 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 Q1 2023.

8.1 Commercial Bank Holdings of Agency MBS

Table 11. Commercial Bank Holdings of Agency MBS

	Commercial Bank Holdings (\$Billions)								
	Sep-22	Oct-22	Nov-22	Dec-22	Jan-22	Feb-23	Mar-23	Apr-23	May-23
Largest 25 Domestic Banks	2,096.8	2,067.6	2,052.0	2,056.5	2,054.5	1,961.4	1,952.3	1,952.4	1,946.7
Small Domestic Banks	712.4	692.2	690.9	677.3	663.5	764.0	700.9	627.8	630.2
Foreign Related Banks	37.4	35.9	39.3	36.6	30.0	27.0	28.4	26.8	24.5
Total, Seasonally Adjusted	2,846.6	2,795.7	2,782.2	2,770.4	2,748.0	2,752.4	2,681.6	2,608.0	2,601.4

Source: Federal Reserve Bank. Note: Small domestic banks include all domestically chartered commercial banks not included in the top 25. Data as of May 2023.

8.2 Bank and Thrift Residential MBS Holdings

In Q1 2023, MBS holdings at banks and thrifts continued to decrease. The decrease was driven by GSE pass-throughs, agency CMO holdings, and Private CMO holdings, with GSE pass-throughs seeing the largest decrease. In contrast, Ginnie Mae pass-throughs saw an increase of 3.9%. Total bank and thrift MBS holdings decreased by approximately 15.8% from Q1 2022 and 2.8% from Q4 2022. Out of the \$2.4 trillion in MBS holdings at banks and thrifts as of Q1 2023, \$1.4 trillion were GSE pass-throughs and \$386 billion were Ginnie Mae pass-throughs.

Table 12. 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
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
4Q22	\$2,423.87	\$1,505.65	\$371.91	\$3.96	\$481.69	\$60.65	\$2,154.46	\$269.41
1Q23	\$2,356.93	\$1,441.18	\$386.32	\$4.12	\$465.24	\$60.08	\$2,088.27	\$268.65
Change:								
4Q22-1Q23	-2.8%	-4.3%	3.9%	3.9%	-3.4%	-0.9%	-3.1%	-0.3%
1Q22-1Q23	-15.8%	-20.7%	4.9%	1.9%	-15.2%	-0.6%	-15.7%	-16.9%

Source: Inside Mortgage Finance. Notes: Data as of Q1 2023.

Table 13. 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	\$441,978.0	\$371,659.0	\$63,657.0	\$6,507.0	\$155.0	18.8%
2	WELLS FARGO & COMPANY	\$242,632.0	\$159,544.0	\$80,344.0	\$2,679.0	\$65.0	10.3%
3	CHARLES SCHWAB	\$165,161.0	\$93,045.0	\$5,902.0	\$66,214.0	\$0.0	7.0%
4	JPMORGAN CHASE & CO.	\$159,776.0	\$68,225.0	\$77,521.0	\$84.0	\$13,946.0	6.8%
5	Truist Bank	\$106,362.0	\$53,175.0	\$12,106.0	\$37,983.0	\$3,098.0	4.5%
6	U.S. BANCORP	\$99,297.1	\$65,567.4	\$22,611.2	\$11,118.5	\$0.1	4.2%
7	CITIGROUP INC.	\$85,290.0	\$71,919.0	\$10,284.0	\$2,359.0	\$728.0	3.6%
8	PNC Bank, National Association	\$72,575.9	\$61,538.1	\$4,239.4	\$5,758.5	\$1,039.9	3.1%
9	CAPITAL ONE FINANCIAL CORPORATION	\$65,965.9	\$31,251.2	\$15,525.8	\$18,843.8	\$345.0	2.8%
10	MORGAN STANLEY	\$50,482.0	\$33,644.0	\$7,486.0	\$9,352.0	\$0.0	2.1%
11	BANK OF NEW YORK MELLON CORP	\$41,504.0	\$29,776.0	\$1,549.0	\$8,193.0	\$1,986.0	1.8%
12	USAA Federal Savings Bank	\$39,747.0	\$33,550.0	\$1,969.0	\$4,228.0	\$0.0	1.7%
13	State Street Bank and Trust Company	\$36,651.0	\$14,278.0	\$6,671.0	\$14,113.0	\$1,589.0	1.6%
14	BMO Harris Bank National Association	\$32,377.2	\$4,377.1	\$6,507.5	\$21,492.6	\$0.0	1.4%
15	The Huntington National Bank	\$29,310.3	\$11,575.7	\$9,649.1	\$7,955.8	\$129.8	1.2%
16	TD Bank USA/TD Bank NA	\$27,683.2	\$1,003.5	\$79.5	\$26,559.3	\$40.9	1.2%
17	KeyBank National Association	\$25,837.8	\$3,868.3	\$195.8	\$21,773.7	\$0.0	1.1%
18	Citizens Bank, National Association	\$22,505.8	\$12,082.1	\$5,622.6	\$4,801.1	\$0.0	1.0%
19	HSBC Bank USA, National Association	\$22,323.7	\$4,445.4	\$12,249.2	\$5,628.4	\$0.8	0.9%
20	Ally Bank	\$20,329.0	\$12,759.0	\$1,870.0	\$1,654.0	\$4,046.0	0.9%
	Total Top 20	\$1,787,788.9	\$1,137,282.7	\$346,039.1	\$277,297.7	\$27,169.3	75.9%

Source: Inside Mortgage Finance. Notes: Data as of Q1 2023.

8.3 Foreign Ownership of MBS

For the month of January 2023, foreign ownership of MBS represented \$1.202 trillion in agency MBS, up approximately \$36 billion from December 2022. Total foreign ownership includes \$567 billion held by foreign private institutions and \$635 billion held by foreign official institutions. The pre-Covid foreign ownership peak of approximately 17.5% has fallen to 13.97% as of January 2023.

Figure 33. Foreign Share of Agency MBS Market

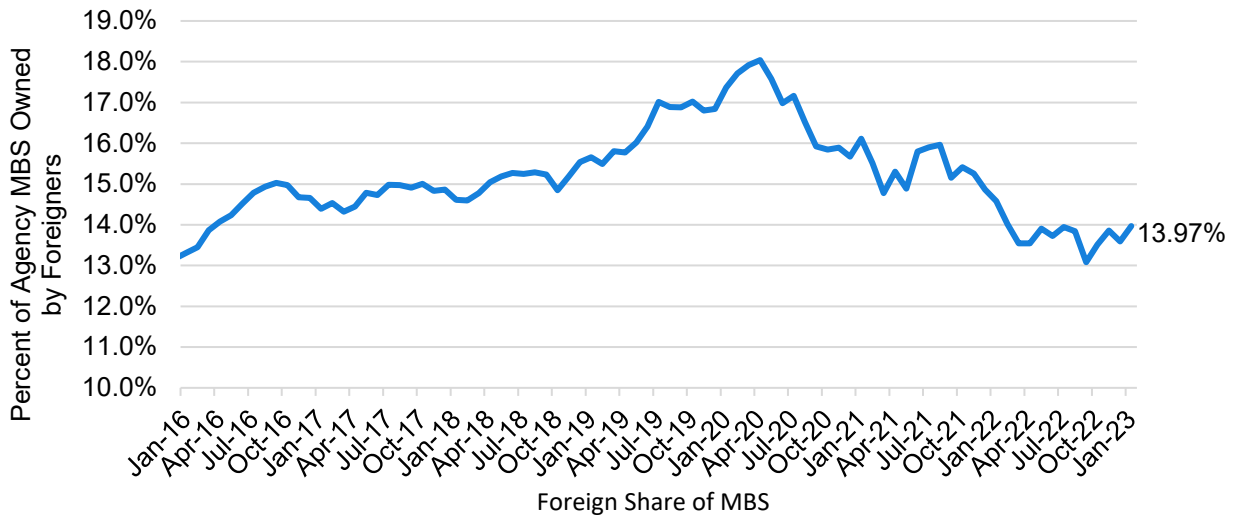
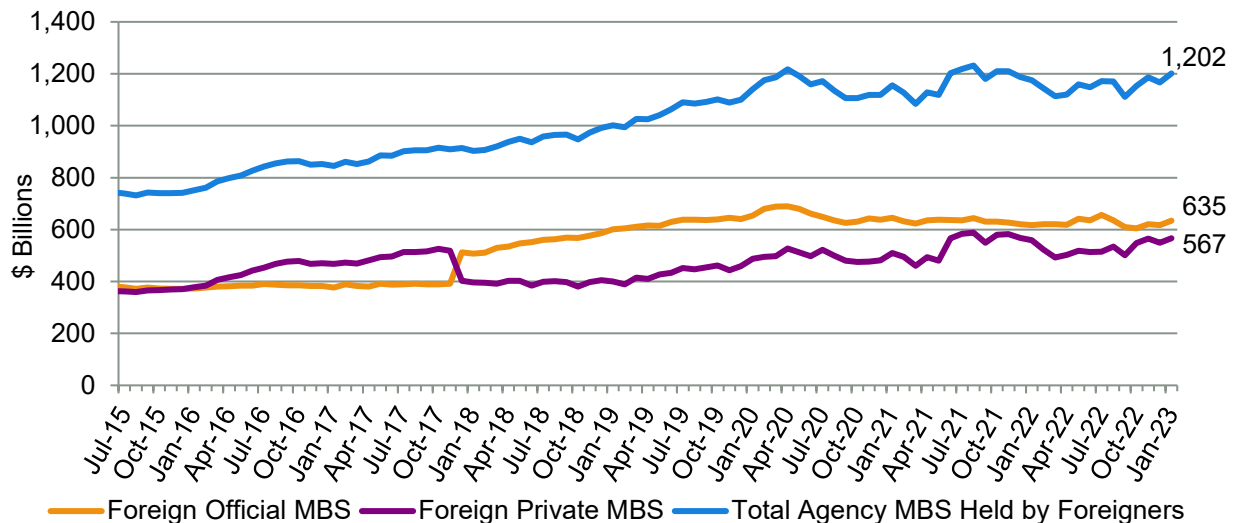


Figure 34. Monthly Foreign MBS Holdings



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 January 2023.

8.4 Foreign Ownership of Agency Debt and Agency MBS

The largest holders of agency MBS were Japan, China, and Taiwan. As of March 2023, these three owned 60% of all foreign owned US MBS. Between March 2022 and March 2023, Japan and China increased their agency MBS holdings while Taiwan's holdings decreased. Japan's holdings increased by \$27.2 billion, China's holdings increased by \$44.3 billion, and Taiwan's holdings decreased by \$20.6 billion.

Table 14. All Agency Debt

Country	Level of Holdings (\$ Millions)				Change in Holdings (\$ Millions)			
	6/1/2022	9/1/2022	12/1/2022	3/1/2023	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Japan	231,437	232,769	278,068	287,050	(28,407)	1,332	45,299	8,982
China	244,389	241,523	251,566	263,891	24,840	(2,866)	10,043	12,325
Taiwan	222,670	209,453	210,309	212,782	(10,670)	(13,217)	856	2,473
Canada	76,391	89,313	97,234	105,527	2,668	12,922	7,921	8,293
Luxembourg	42,840	38,559	47,142	51,268	9,456	(4,281)	8,583	4,126
United Kingdom	66,229	56,348	61,418	41,147	17,793	(9,881)	5,070	(20,271)
South Korea	37,963	35,643	36,240	38,146	(2,365)	(2,320)	597	1,906
Cayman Islands	34,981	35,081	30,954	29,485	3,009	100	(4,127)	(1,469)
Ireland	20,204	17,692	22,478	25,100	(385)	(2,512)	4,786	2,622
France	16,706	16,199	19,805	22,578	(421)	(507)	3,606	2,773
Other	199,626	191,424	187,241	196,266	12,816	(8,202)	(4,183)	9,025
Total	1,193,436	1,164,004	1,242,455	1,273,240	28,334	(29,432)	78,451	30,785

Table 15. Agency MBS

Country	Level of Holdings (\$ Millions)		
	3/1/2022	3/1/2023	YoY Change in Holdings (\$ Millions)
Japan	259,844	287,050	27,206
China	219,549	263,891	44,342
Taiwan	233,340	212,782	-20,558
Canada	73,723	105,527	31,804
Luxembourg	33,384	51,268	17,884
United Kingdom	48,436	41,147	-7,289
South Korea	40,328	38,146	-2,182
Cayman Islands	31,972	29,485	-2,487
Ireland	20,589	25,100	4,511
France	17,127	22,578	5,451
Other	186,810	196,266	9,456
Total	1,165,102	1,273,240	108,138

Source: Treasury International Capital (TIC). Note: Level of agency debt Holdings by month data as of Q1 2023. Agency MBS as of March 2023. Revised to include top 10 holders of agency debt listed as of March 2023.

9 FIXED INCOME LIQUIDITY INDICATORS

The agency MBS average daily trading volume as of month-end May 2023 was \$240 billion, which was down from a monthly average of \$241 billion for calendar year 2022. As of month-end May 2023, agency MBS average daily trading volume increased 2.7% MoM. See footnote below for update on “Average Daily Turnover by Sector” data.

Figure 35. Average Daily Trading Volume by Sector

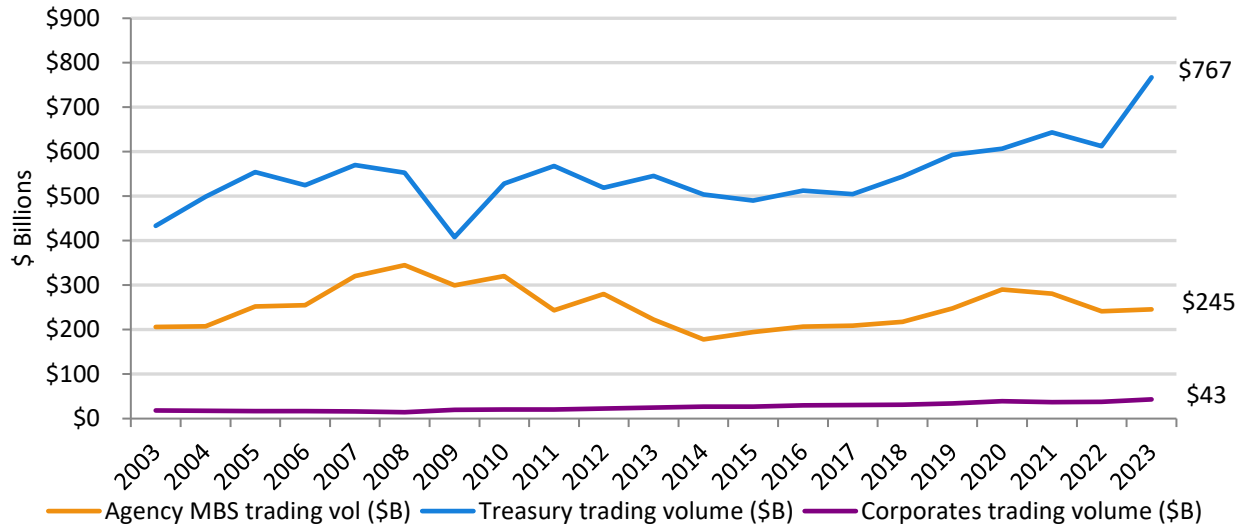
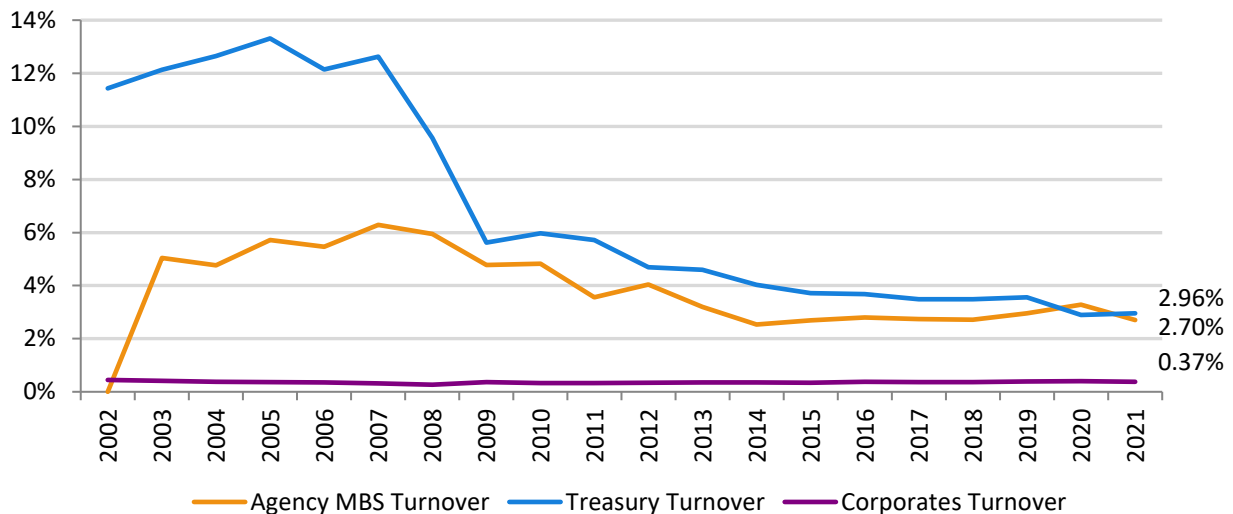


Figure 36. Average Daily Turnover by Sector



Source: SIFMA. Note: Data as of May 2023 for Average Daily Trading Volume by Sector and as of December 2021 for agency MBS in Average Daily Turnover by Sector. The MBS outstanding database for Turnover by Sector is under maintenance and is not updated in this report.

PRIMARY MORTGAGE MARKET

10 AGENCY CREDIT BREAKDOWN

Tables 16, 17, and 18 below outline the population distributions of FICOs, DTIs, and LTVs between the agencies and between FHA, VA, and other Ginnie Mae loan sources as of month-end May 2023. The distribution statistics capture some key differences in the populations served by the agencies.

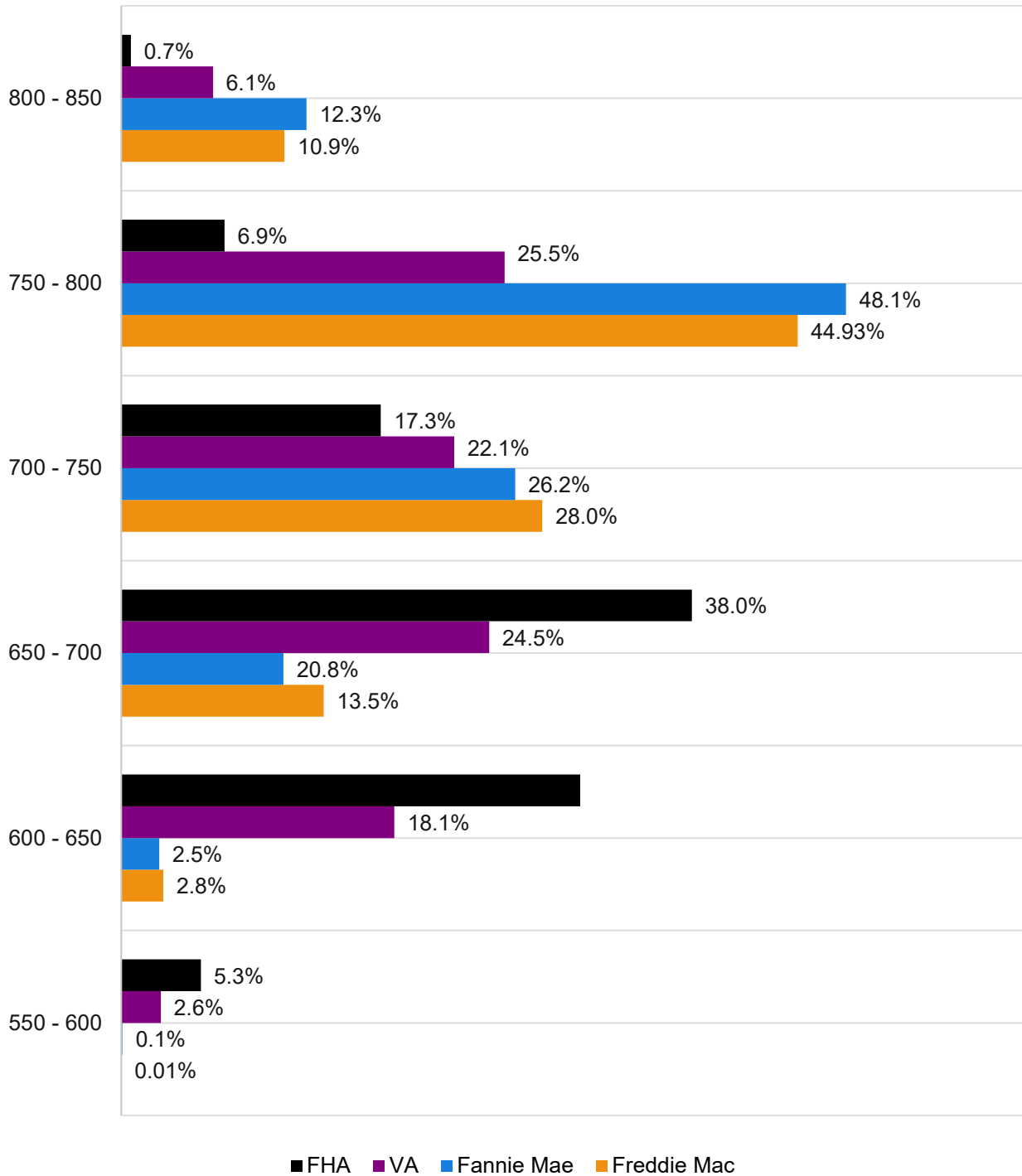
10.1 Credit Scores

Table 16. Share of Loans by FICO Score

<i>Purchase FICO</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	230,630	650	691	744	782	799	734
Fannie	76,767	695	731	767	790	803	757
Freddie	74,390	690	725	762	789	802	753
Ginnie	79,473	625	649	685	734	777	693
<i>Refi FICO</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	50,777	627	661	711	763	792	709
Fannie	18,552	669	708	751	783	801	742
Freddie	13,470	658	691	732	773	795	730
Ginnie	18,755	598	628	658	693	735	661
<i>All FICO</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	281,407	645	685	739	780	798	729
Fannie	95,319	689	727	764	789	802	754
Freddie	87,860	683	719	759	787	801	750
Ginnie	98,228	621	645	679	727	772	687
<i>Purchase FICO: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	79,473	625	649	685	734	777	693
FHA	49,922	621	644	672	708	748	678
VA	26,122	635	671	725	774	797	720
Other	3,429	633	657	695	733	764	696
<i>Refi FICO: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	18,755	598	628	658	693	735	661
FHA	12,419	594	625	652	683	716	654
VA	6,318	606	637	673	717	760	677
Other	18	636.9	645	676.5	750	787.3	698
<i>All FICO: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
All	98,228	621	645	679	727	772	687
FHA	62,341	616	640	668	703	743	673
VA	32,440	628	661	713	767	794	712
Other	3,447	633	657	694	733	764	696

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

Figure 37. FICO Distributions by Agency



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

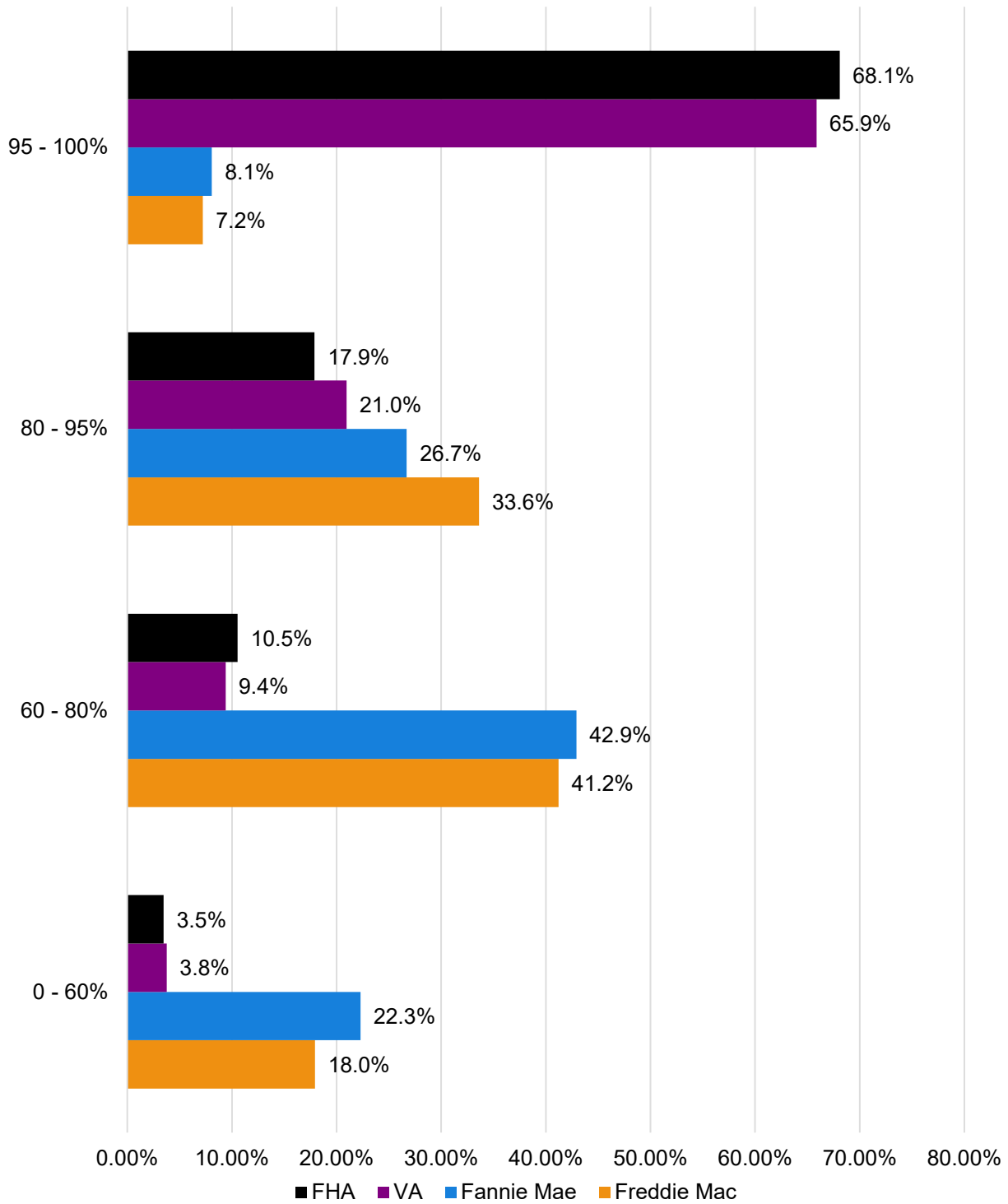
10.2 Loan-to-Value (LTV)

Table 17. Share of Loans by LTV

<i>Purchase LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	230,925	65	80	91.58	98.18	99	85.7
<i>Fannie</i>	76,874	56	75	80	95	96	79.2
<i>Freddie</i>	74,415	59	75	80	95	95	80.7
<i>Ginnie</i>	79,636	91.2	98.2	98.2	100	100	96.5
<i>Refi LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	50,360	33	50	67	79.4	83	63.1
<i>Fannie</i>	18,555	27	41	58	70	77	54.8
<i>Freddie</i>	13,470	29	45	60	72	80	57.2
<i>Ginnie</i>	18,335	55.7	69.5	80	81.4	90.7	75.9
<i>All LTV</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	281,285	54	75	86	97	98.2	81.6
<i>Fannie</i>	95,429	45	65	80	90	95	74.5
<i>Freddie</i>	87,885	50	70	80	95	95	77.1
<i>Ginnie</i>	97,971	76.7	91.2	98.2	99	100	92.6
<i>Purchase LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	79,636	91.2	98.2	98.2	100	100	96.5
<i>FHA</i>	50,010	91.6	97.7	98.2	98.2	98.2	96.3
<i>VA</i>	26,183	85.8	100	100	100	102.3	96.6
<i>Other</i>	3,443	93.6	98.6	101	101.0	101.0	98.4
<i>Refi LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	18,335	55.7	69.5	80	81.4	90.7	75.9
<i>FHA</i>	12,466	53.1	66.8	77.4	81.4	81.4	72.2
<i>VA</i>	5,830	63.6	77.2	88.7	92.8	100	83.8
<i>Other</i>	39	69.9	82.5	90.8	93.2	99.2	86.2
<i>All LTV: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	97,971	76.7	91.2	98.2	99	100	92.6
<i>FHA</i>	62,476	75.4	89.6	98.2	98.2	98.2	91.5
<i>VA</i>	32,013	79.3	91.1	100	100	102.2	94.2
<i>Other</i>	3,482	93.0	98.4	101	101.01	101.0	98.2

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

Figure 38. Loan-to Value by Agency



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

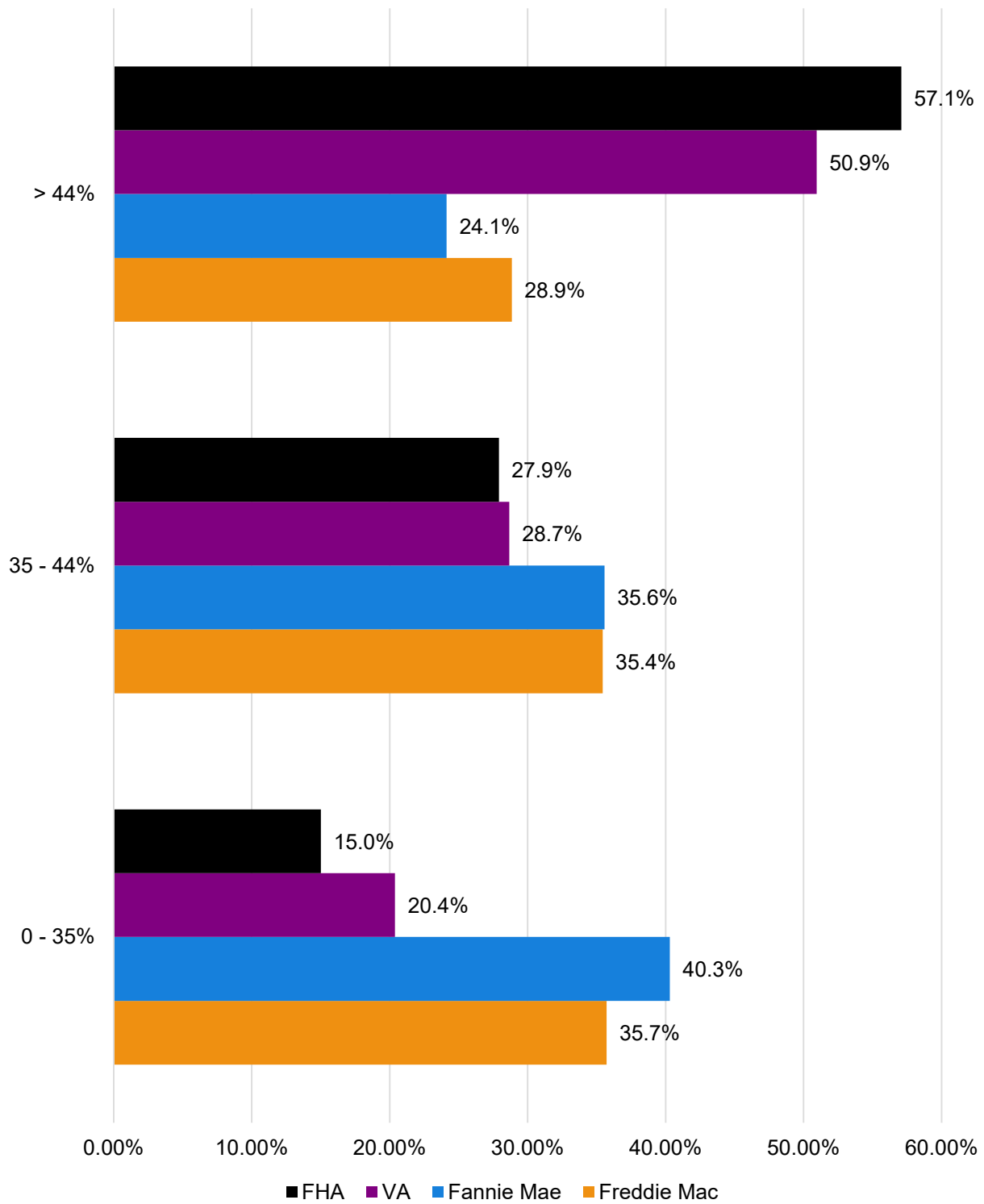
10.3 Debt-to-Income (DTI)

Table 18. Share of Loans by DTI

<i>Purchase DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	230,597	26	33.2	41	47	50	39.7
<i>Fannie</i>	76,874	24	31	38	45	48	37.0
<i>Freddie</i>	74,415	25	32	39	45	49	37.9
<i>Ginnie</i>	79,308	31.6	38.2	45.0	51.0	55.1	44.0
<i>Refi DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	50,142	25	32	40	46	50	38.8
<i>Fannie</i>	18,555	22	29	37	43	47	35.8
<i>Freddie</i>	13,470	24	32	40	45	49	38.3
<i>Ginnie</i>	18,117	28.8	36.0	43.6	49.7	54.5	42.3
<i>All DTI</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	280,739	26	33	41	47	50	39.6
<i>Fannie</i>	95,429	23	30	38	44	48	36.8
<i>Freddie</i>	87,885	25	32	40	45	49	37.9
<i>Ginnie</i>	97,425	31.0	37.8	44.7	50.7	55.0	43.7
<i>Purchase DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	79,308	31.6	38.2	45.0	51.0	55.1	44.0
<i>FHA</i>	49,996	33.1	39.6	46.0	51.5	55.0	44.8
<i>VA</i>	25,868	30.0	37.2	44.6	50.9	55.8	43.7
<i>Other</i>	3,444	27.3	31.8	36.2	39.8	41.7	35.3
<i>Refi DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	18,117	28.8	36.0	43.6	49.7	54.5	42.3
<i>FHA</i>	12,387	29.3	36.6	44	49.9	54.7	42.7
<i>VA</i>	5,712	27.6	34.8	42.5	49.2	54.0	41.5
<i>Other</i>	18	26.1	30.6	34.8	38.3	39.6	33.7
<i>All DTI: Ginnie Mae Breakdown By Source</i>							
Names	Number of Loans	P10	P25	Median	P75	P90	Mean
<i>All</i>	97,425	31.0	37.8	44.7	50.7	55.0	43.7
<i>FHA</i>	62,383	32.3	39.0	45.6	51.2	55.0	44.4
<i>VA</i>	31,580	29.6	36.7	44.2	50.5	55.4	43.3
<i>Other</i>	3,462	27.3	31.7	36.2	39.8	41.7	35.3

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

Figure 39. Debt-to Income by Agency



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

10.4 High LTV Loans: Ginnie Mae vs. GSEs

Comparing the three-month range of March 2022 – May 2022 to the three-month range of March 2023 – May 2023, the share of high-LTV agency loans are going to borrowers with:

- FICO scores above 750 decreased by approximately 6.4%.
- DTIs below 35% decreased by approximately 14.5%.

YoY, the share of high-LTV loans increased in the Ginnie Mae guarantee book by approximately 16% and in the GSE portfolios by approximately 60%. 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 71.12% of its issuances between March 2023 – May 2023 having LTVs of 95 or above, compared to 24.65% for the GSEs.

Table 19. Share of Loans with LTV > 95

	Ginnie Mae	GSE	All
Mar 2022 - May 2022	61.06%	15.37%	28.26%
Mar 2023 - May 2023	71.12%	24.65%	42.06%

Table 20. Agency Market Share by DTI and FICO for Loans with LTV > 95 (March 2022-May 2022)

		FICO					
DTI	<650	650-700	700-750	≥750	NA	All	
<35	2.16%	3.80%	5.16%	8.41%	0.06%	19.58%	
35-45	5.15%	8.15%	9.12%	10.16%	0.05%	32.63%	
≥45	6.01%	9.51%	13.50%	14.07%	0.05%	43.13%	
NA	0.86%	0.56%	0.36%	0.29%	2.60%	4.67%	
All	14.17%	22.02%	28.13%	32.93%	2.75%	100.00%	

Table 21. Agency Market Share by DTI and FICO for Loans with LTV > 95 (March 2023-May 2023)

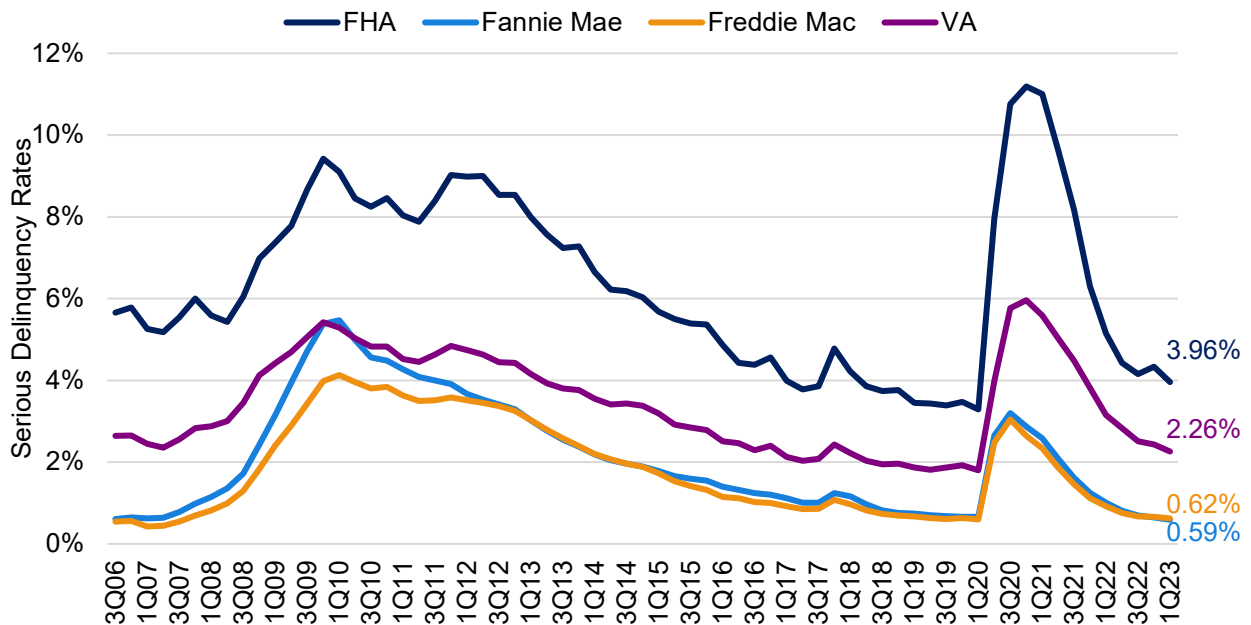
		FICO					
DTI	<650	650-700	700-750	≥750	NA	All	
<35	2.04%	3.08%	4.44%	7.13%	0.06%	16.74%	
35-45	5.80%	8.46%	10.28%	11.96%	0.05%	36.56%	
≥45	8.01%	13.09%	12.60%	11.56%	0.07%	45.33%	
NA	0.30%	0.21%	0.13%	0.18%	0.56%	1.37%	
All	16.15%	24.84%	27.46%	30.18%	0.74%	100.00%	

Sources: Recursion and Ginnie Mae. Data as of May 2023.

10.5 Serious Delinquency Rates

Serious delinquency rates for single-family GSE, VA, and FHA loans all fell in Q1 2023. From Q4 2022 to Q1 2023, Fannie and Freddie serious delinquencies decreased by 6 and 4 bps, respectively. Ginnie Mae collateral’s serious delinquency rates decreased more than the GSE rate, with VA decreasing 17 bps and FHA decreasing 37 bps. This overall decline in serious delinquency rates is consistent with the decrease in the number of loans in forbearance captured in [Section 11 below](#).

Figure 40. 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 Q1 2023.

10.6 Credit Box

The first-time homebuyer share for agency purchase loans was 54.7% as of month-end May 2023, a decrease from 56.2% in April 2023 but is up from 53.4% in May 2022. Ginnie Mae and Fannie Mae’s first-time homebuyer shares, 69.0% and 47.4% respectively, as of month-end May 2023, have remained relatively flat YoY. Freddie Mac’s first-time homebuyer share increased 10.3% YoY. **Table 22** shows that based on mortgages originated as of month-end May 2023, the average GSE first-time homebuyer was more likely to have a lower credit score and higher LTV. Ginnie Mae’s first-time homebuyers were more likely to have lower loan amounts, credit scores, and DTI while loan rates were very similar.

Figure 41. First-Time Homebuyer Share: Purchase Only Loans

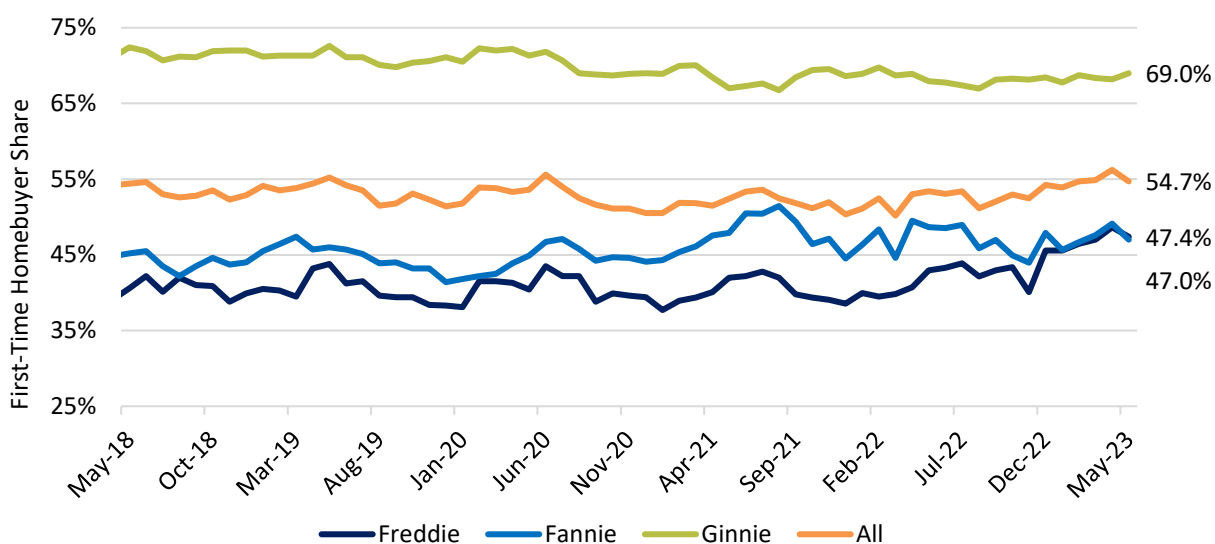


Table 22. Agency First-Time Homebuyer Share Summary

	Fannie Mae		Freddie Mac		Ginnie Mae		All	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount \$	339,381	337,852	328,686	348,579	301,846	364,209	320,074	348,096
Credit Score	750.3	762.9	746.4	759.6	686.8	705.8	721.6	748.2
LTV (%)	85.1	74.0	85.9	76.0	97.4	94.5	90.7	79.6
DTI (%)	36.9	37.1	37.8	37.9	43.6	45.0	40.1	39.2
Loan Rate (%)	6.3	6.4	6.4	6.4	6.2	6.1	6.3	6.3

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

In the Ginnie Mae purchase market, 76.8% of FHA loans, 52.0% of VA loans, and 84.3% of other loans provided financing for first-time home buyers as of month-end May 2023. While VA loans were unchanged MoM, FHA and other loans increased. **Table 23** shows that based on mortgages originated as of month-end May 2023; 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 18.0% smaller loans, had a 23.6-point lower credit score, 4.5% higher LTVs and had a 20 bp higher interest rate. FHA’s first-time homebuyers are much more like their repeat buyers, with only 7.1% smaller loans, 10 bps higher in interest rate, and 2.3% 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 42. First-time Homebuyer Share: Ginnie Mae Breakdown

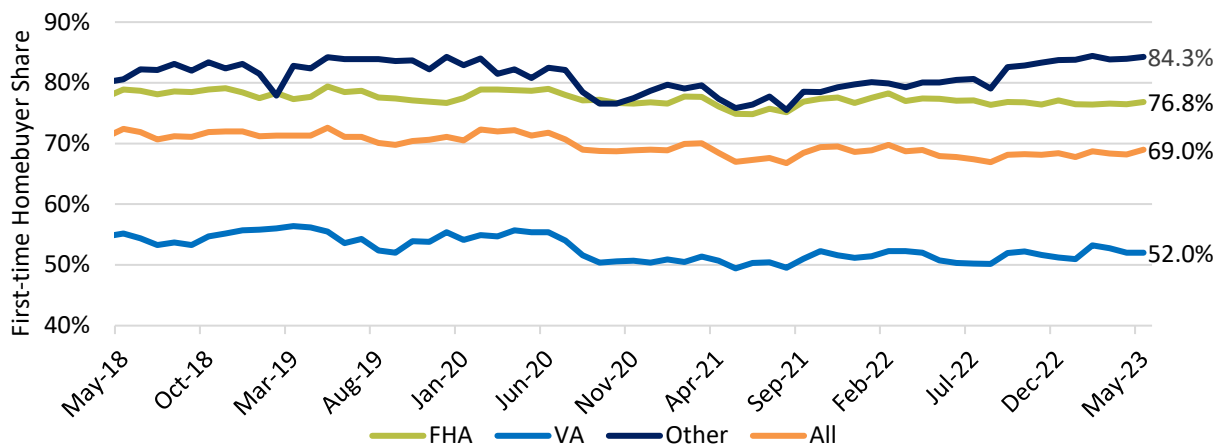


Table 23. Ginnie Mae First-Time Homebuyer Share Breakdown Summary

	FHA		VA		Other		Total	
	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat	First-Time	Repeat
Loan Amount \$	298,229	321,094	337,299	411,159	183,526	197,553	301,846	364,209
Credit Score	678.4	677.2	708.8	732.4	695.5	701.7	686.8	705.8
LTV (%)	96.8	94.6	98.7	94.2	98.4	98.2	97.4	94.5
DTI (%)	44.5	46.0	42.9	44.4	35.2	36.0	43.6	45.0
Loan Rate (%)	6.2	6.2	6.2	6.0	6.3	6.2	6.2	6.1

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

10.7 Credit Box: Historical

The median FICO score for all agency loans originated as of month-end May 2023 was 736, which represents a 6-point increase YoY from May 2022. Ginnie Mae median FICO scores increased 4 points between May 2022 and May 2023 to 675. As of month-end May 2023, average FICO scores for refinances increased for Fannie Mae and Freddie Mac borrowers by 2 and 9 points YoY, respectively.

Figure 43. FICO Scores for All Loans

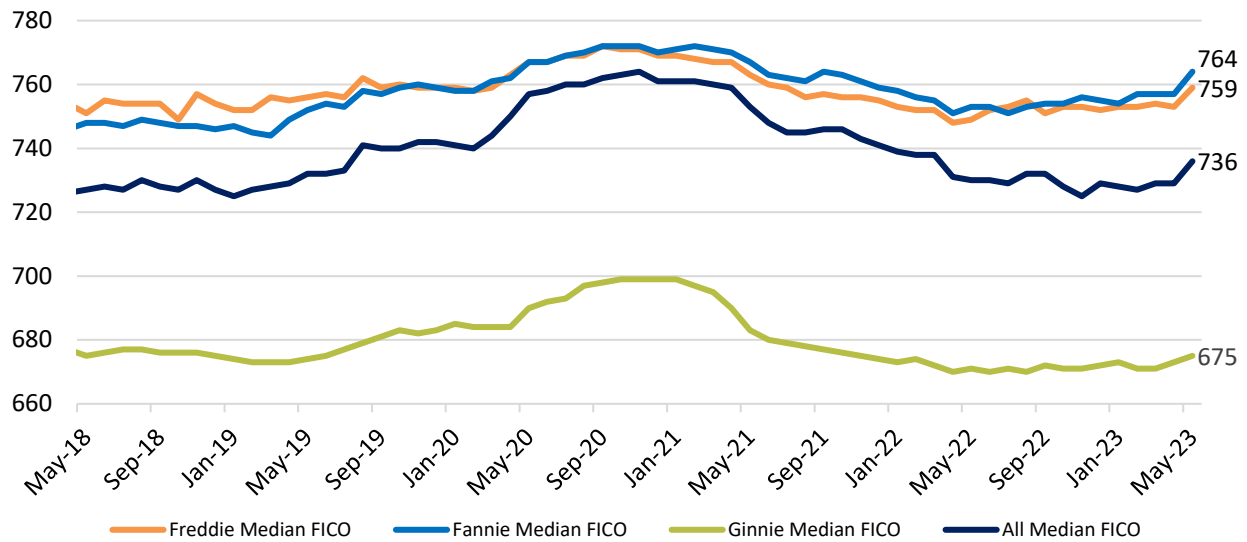


Figure 44. FICO Scores for Purchase Loans

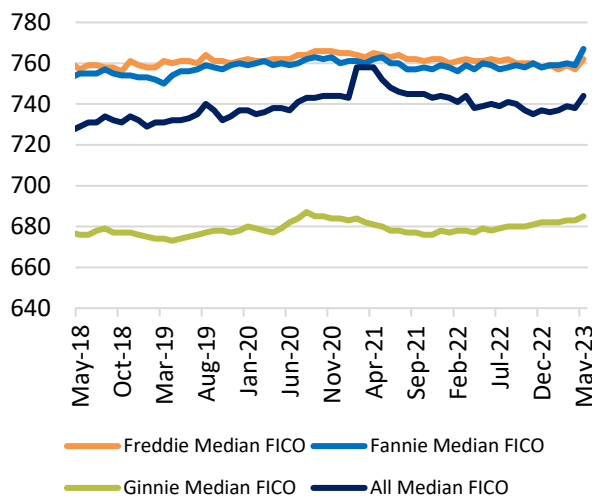
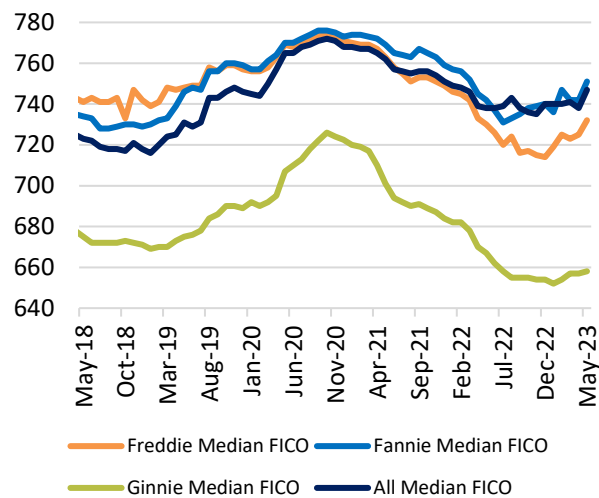


Figure 45. FICO Scores for Refinance Loans



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

In May 2023, the median LTV for Ginnie Mae loans was 98.2% compared to 80% for Fannie Mae and Freddie Mac, owing primarily to the lower down-payment requirements for government loan programs. Freddie Mac and Fannie Mae each saw increases in median LTV YoY from 75% in May 2022 whereas Ginnie Mae LTVs remained flat from 98.2% over the same period. In May 2023, median DTIs for Ginnie Mae, Freddie Mac, and Fannie Mae were 44.8%, 40.0%, and 38.0% respectively. In May 2022, median DTIs for Ginnie Mae, Fannie Mae, and Freddie Mac were 43.3%, 38.0%, and 38.0%.

Figure 46. LTV Ratio for All Loans

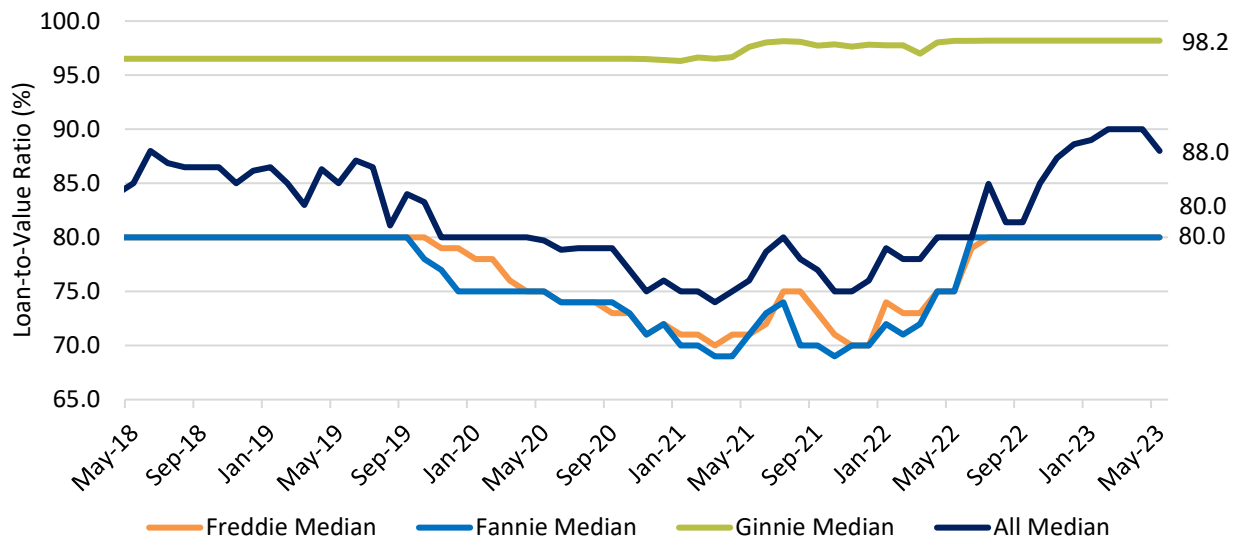
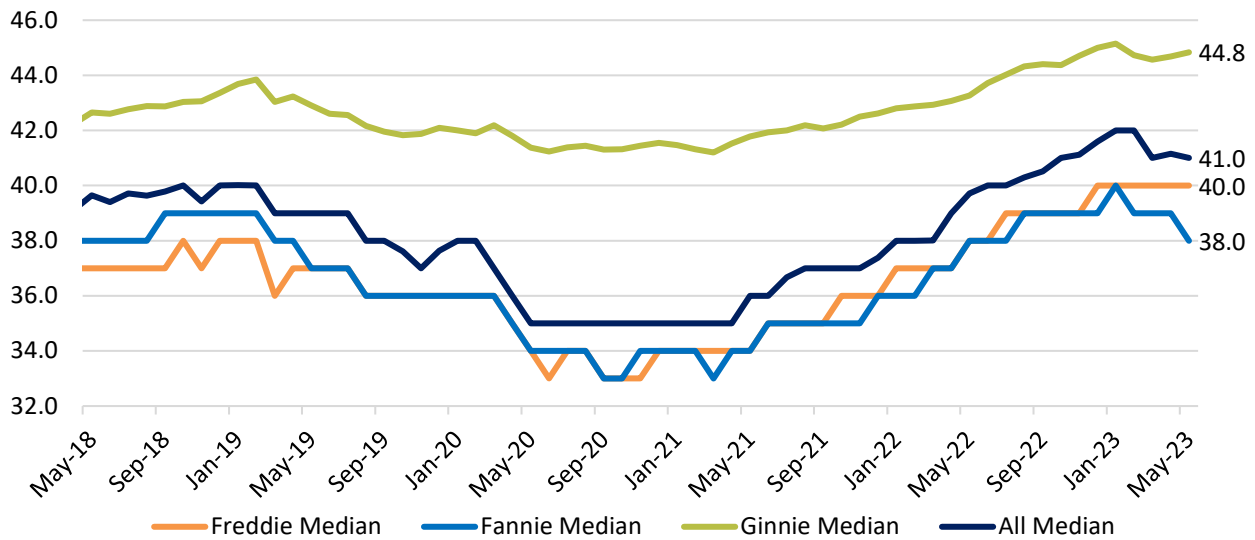


Figure 47. DTI Ratio for All Loans



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

11 FORBEARANCE TRENDS

At the end of May 2023, 96,419 Ginnie Mae loans were in forbearance. The number of loans in forbearance removed from MBS pools in May was 519 while 95,900 loans in forbearance remain in pools. The number of loans in forbearance and loans that remained in pools increased MoM while loans in forbearance that were removed from pools remained the same. The median current principal balance for Ginnie Mae, FHA, and VA was higher for loans in forbearance originated by nonbanks than banks in all subsets.

Table 24. Forbearance Snapshot

All Loans in Forbearance – May 2023						
	FICO Score*	Note Rate*	Current Principal Balance Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie	656	3.7	\$210,373	73.6	75.7	96,419
Bank	672	3.9	\$148,305	81.9	87.2	10,658
Nonbank	655	3.7	\$218,120	72.8	74.8	85,744
FHA	652	3.8	\$205,878	77.3	78.8	71,731
Bank	671	4.0	\$146,070	85.1	90.1	8,843
Nonbank	650	3.8	\$214,214	76.5	77.8	62,876
VA	666	3.5	\$266,645	58.0	63.1	18,106
Bank	676	3.6	\$190,463	58.6	69.1	1,234
Nonbank	666	3.5	\$271,338	58.0	62.8	16,869
Loans in Forbearance and Removed from Pools – May 2023						
	FICO Score*	Note Rate*	Current Principal Balance Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie	665	3.6	\$186,518	64.4	63.6	519
Bank	673	4.0	\$110,810	69.6	76.6	114
Nonbank	663	3.5	\$206,704	63.5	61.8	405
FHA	655	3.8	\$175,852	69.6	69.5	342
Bank	671	4.1	\$95,403	74.4	76.4	89
Nonbank	651	3.7	\$205,452	68.7	68.4	253
VA	679	3.3	\$228,500	47.5	49.6	136
Bank	674	3.9	\$182,382	52.0	65.3	13
Nonbank	680	3.2	\$236,647	47.0	48.5	123
Loans in Forbearance that Remain in Pools – May 2023						
	FICO Score*	Note Rate*	Current Principal Balance Median	First Time Homebuyer Share (%)	Purchase Share (%)	Loan Count
Ginnie	656	3.7	\$210,517	73.6	75.7	95,900
Bank	672	3.9	\$148,798	82.0	87.3	10,544
Nonbank	655	3.7	\$218,183	72.9	74.9	85,339
FHA	652	3.8	\$206,000	77.3	78.8	71,389
Bank	671	4.0	\$146,471	85.2	90.1	8,754
Nonbank	650	3.8	\$214,286	76.5	77.8	62,623
VA	666	3.5	\$266,942	58.1	63.2	17,970
Bank	676	3.6	\$190,650	58.7	69.1	1,221
Nonbank	665	3.5	\$271,565	58.1	62.9	16,746

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 May 2023; *Averages weighted by remaining principal balance of the loans.

12 HOLDERS OF GINNIE MAE MORTGAGE SERVICING RIGHTS

The 30 largest owners of mortgage servicing rights (MSR) by UPB for loans collateralizing Ginnie Mae MBS is shown in **Table 25**. The top 30 firms collectively own 87.02% of Ginnie Mae MSRs (see Cumulative Share). Twenty-three of these top 30 are non-depository institutions, the remaining seven are depository institutions. As of May 2023, over half (54.27%) of the Ginnie Mae MSRs are owned by the top six firms.

Table 25. Top 30 Holders of Ginnie Mae Mortgage Servicing Rights (MSRs), by UPB

MSR Holder	Rank			UPB (\$ millions)	Share	Cumulative Share	CPR	CDR
	Current	Year prior	Change					
LAKEVIEW LOAN SERVIC	1	3	↑	\$298,104,424,497	13.57%	13.57%	7.70%	0.92%
DBA FREEDOM HOME MOR	2	1	↓	\$278,021,492,231	12.66%	26.23%	8.38%	0.87%
PENNYMAC LOAN SERVIC	3	2	↓	\$256,737,071,106	11.69%	37.92%	8.45%	0.88%
NATIONSTAR MORTGAGE,	4	6	↑	\$127,446,195,322	5.80%	43.72%	8.30%	0.97%
NEWREZ LLC	5	8	↑	\$122,898,985,726	5.59%	49.31%	6.93%	0.47%
WELLS FARGO BANK, NA	6	4	↓	\$108,946,251,093	4.96%	54.27%	7.41%	0.30%
ROCKET MORTGAGE, LLC	7	5	↓	\$105,808,804,814	4.82%	59.09%	9.65%	0.63%
CARRINGTON MORTGAGE	8	7	↓	\$93,715,454,813	4.27%	63.35%	8.14%	0.76%
U. S. BANK, NA	9	10	↑	\$53,396,510,050	2.43%	65.79%	6.29%	0.60%
PLANET HOME LENDING,	10	14	↑	\$49,039,941,082	2.23%	68.02%	6.57%	0.39%
UNITED WHOLESALE MOR	11	11	↔	\$42,580,882,708	1.94%	69.96%	4.67%	0.54%
LOANDEPOT.COM,LLC	12	13	↑	\$37,872,246,710	1.72%	71.68%	7.96%	1.09%
AMERIHOMES MORTGAGE C	13	17	↑	\$36,096,946,615	1.64%	73.32%	5.66%	0.43%
NAVY FEDERAL CREDIT	14	16	↑	\$29,194,998,065	1.33%	74.65%	8.11%	0.38%
MORTGAGE RESEARCH CE	15	12	↓	\$26,768,957,865	1.22%	75.87%	7.17%	0.26%
GUILD MORTGAGE COMPA	16	19	↑	\$22,929,904,432	1.04%	76.92%	7.89%	0.82%
THE MONEY SOURCE INC	17	18	↑	\$21,203,909,428	0.97%	77.88%	7.67%	0.68%
TRUIST BANK	18	20	↑	\$20,137,931,213	0.92%	78.80%	7.89%	0.87%
CROSSCOUNTRY MORTGAG	19	21	↑	\$19,237,426,005	0.88%	79.67%	7.57%	0.58%
NEW AMERICAN FUNDING	20	22	↑	\$18,539,238,690	0.84%	80.52%	7.17%	0.40%
VILLAGE CAPITAL & IN	21	23	↑	\$18,246,927,792	0.83%	81.35%	10.12%	1.63%
CMG MORTGAGE, INC.	22	27	↑	\$17,943,428,007	0.82%	82.16%	6.30%	0.35%
MOVEMENT MORTGAGE, LL	23	28	↑	\$17,928,885,561	0.82%	82.98%	6.34%	0.42%
IDAHO HOUSING AND FI	24	25	↑	\$15,222,406,826	0.69%	83.67%	6.09%	1.48%
PHH MORTGAGE CORPORA	25	NR	↑	\$14,176,831,057	0.65%	84.32%	7.43%	1.05%
CITIZENS BANK N.A.	26	26	↔	\$13,877,797,719	0.63%	84.95%	7.20%	0.28%
FLAGSTAR BANK, N.A.	27	NR	↑	\$12,637,287,677	0.58%	85.53%	6.57%	0.43%
MIDFIRST BANK	28	29	↑	\$12,344,548,700	0.56%	86.09%	7.53%	1.43%
CARDINAL FINANCIAL C	29	30	↑	\$10,380,776,547	0.47%	86.56%	6.78%	0.86%
SUN WEST MORTGAGE CO	30	NR	↑	\$10,195,673,364	0.46%	87.02%	6.92%	0.21%

Sources: Deloitte, Recursion. Notes: Data as of May 2023.

13 AGENCY NONBANK ORIGINATORS

Total agency nonbank origination share increased only slightly as of month-end May 2023 by approximately 0.1% MoM. The stagnation in nonbank origination share was driven by an increase in both Ginnie Mae and Fannie Mae nonbank origination share (up 2.3% and 2.0% MoM, respectively) counteracted by a decrease in Freddie Mac nonbank origination share (down 3.0%). The Ginnie Mae nonbank share rose to 90.8% as of May 2023 and has remained consistently higher than the GSEs, largely driven by origination share of refinance mortgage loans.

Figure 48. Agency Nonbank Originator Share (All, Purchase, Refi)

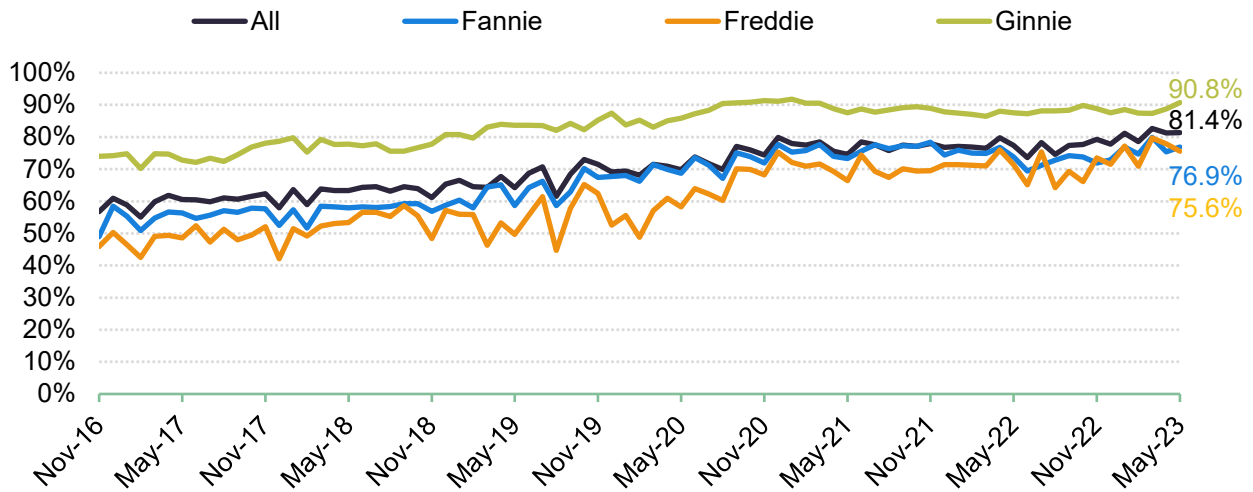


Figure 49. Nonbank Origination Share: Purchase Loans

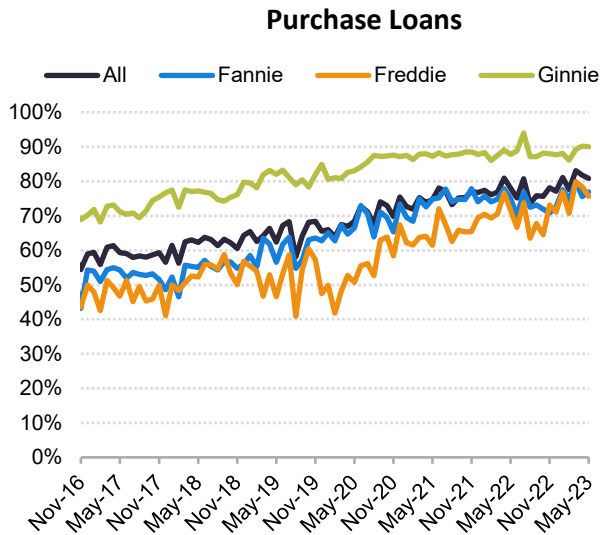
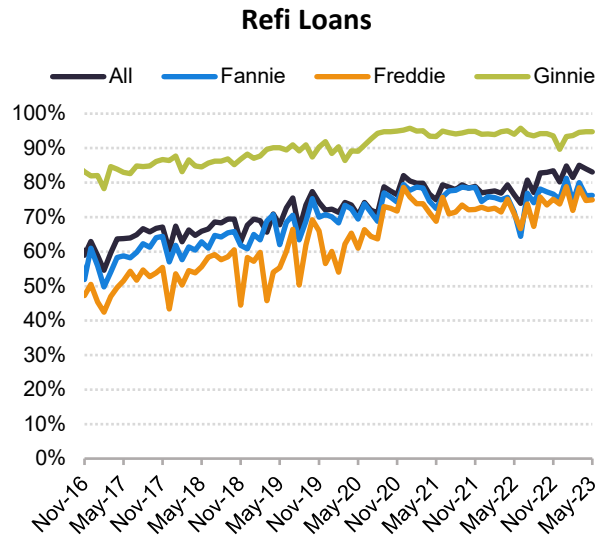


Figure 50. Nonbank Origination Share: Refi Loans



Sources: Recursion. Notes: Data as of May 2023.

Ginnie Mae’s total nonbank originator share remained relatively stable as of month-end May 2023. Ginnie Mae continues to have a high proportion of nonbank originations, with a rate of 90.8% in May 2023. The percent of Ginnie Mae’s Other nonbank refinanced loans increased slightly to 88.9% in May 2023.

Figure 51. Ginnie Mae Nonbank Originator Share (All, Purchase, Refi)

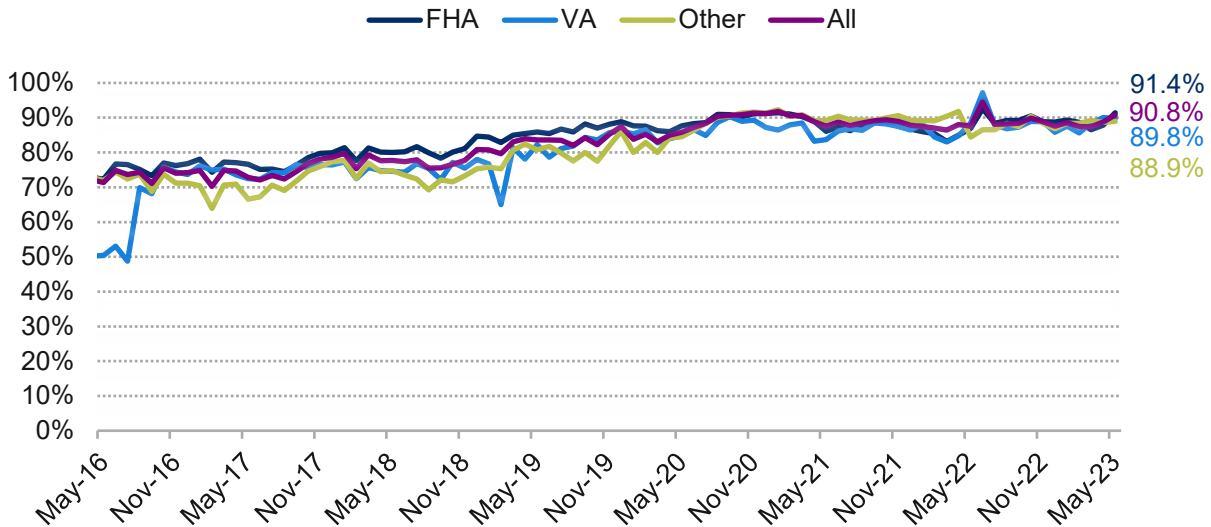


Figure 52. Ginnie Mae Nonbank Share: Purchase Loans

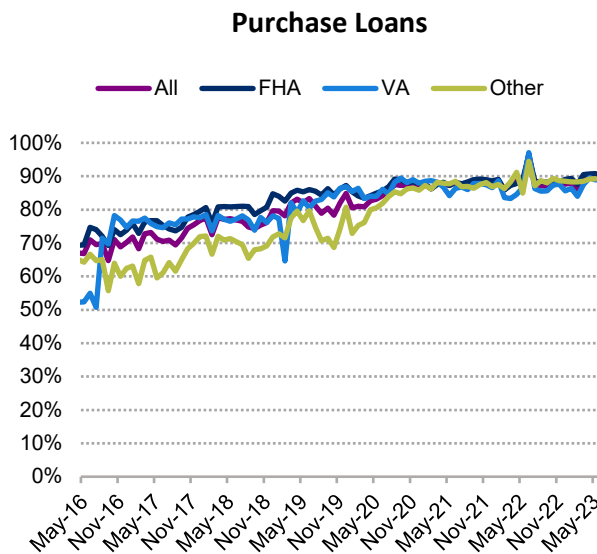
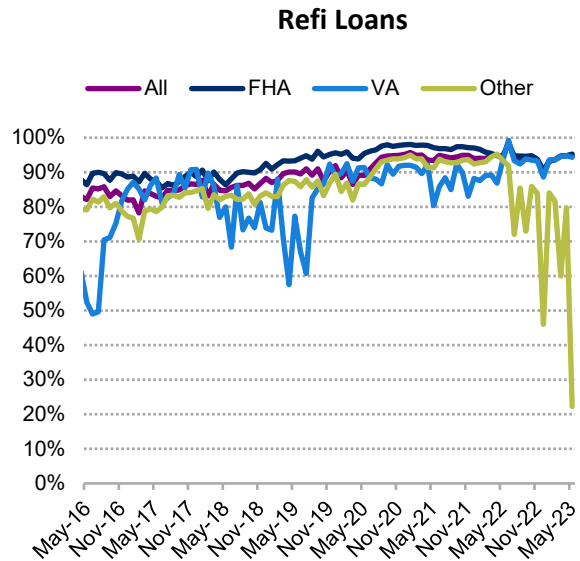


Figure 53. Ginnie Mae Nonbank Share: Refi Loans



Sources: Recursion. Notes: Data as of May 2023.

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

13.1.1 (FICO, LTV, DTI)

The mortgage loan originations of nonbanks continue to have a consistently lower median FICO score than their bank counterparts across all agencies. The spread between nonbank and bank FICO scores increased by 6 points from April 2023 to May 2023. The agency median FICO also increased by 6 points MoM to 736.

Figure 54. Agency FICO: Bank vs. Nonbank

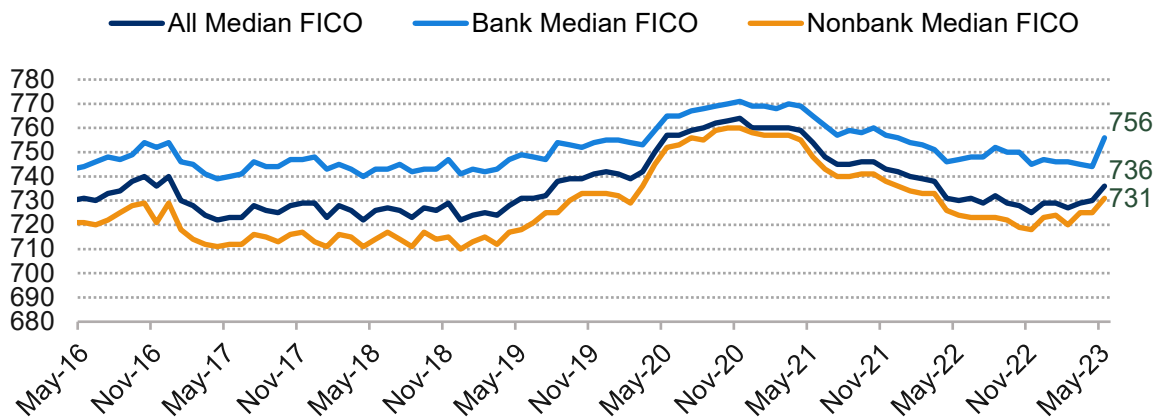


Figure 55. GSE FICO: Bank vs. Nonbank

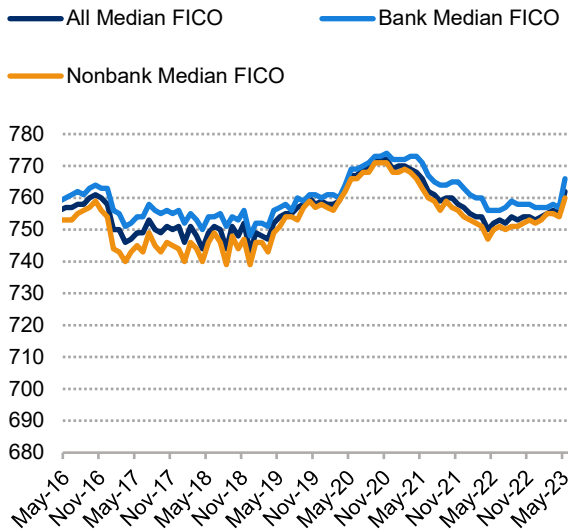
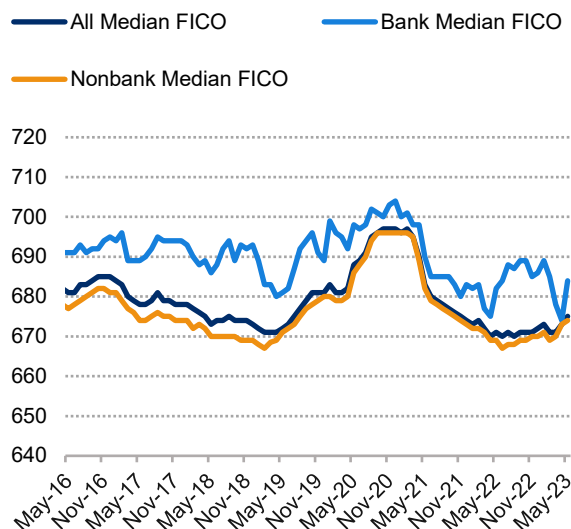


Figure 56. Ginnie Mae FICO: Bank vs. Nonbank



Sources: Recursion. Notes: Data as of May 2023.

The median LTV for all GSE originators remained the same as of month-end May 2023 MoM at 80%. Ginnie Mae median bank and nonbank LTV remained flat at 98.19% MoM. Ginnie Mae median DTI increased MoM to approximately 45.0% in May 2023 in nonbank originations.

Figure 57. GSE LTV: Bank vs. Nonbank

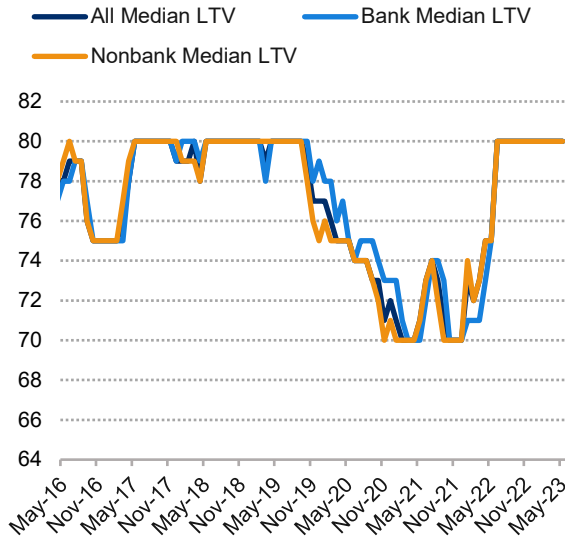


Figure 58. Ginnie Mae LTV: Bank vs. Nonbank

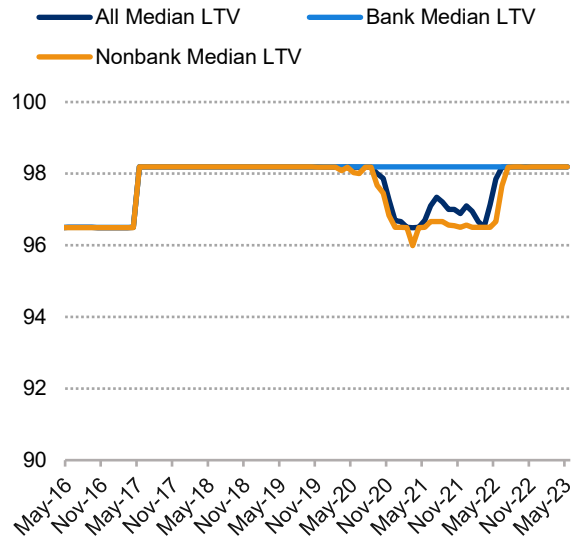


Figure 59. GSE DTI: Bank vs. Nonbank

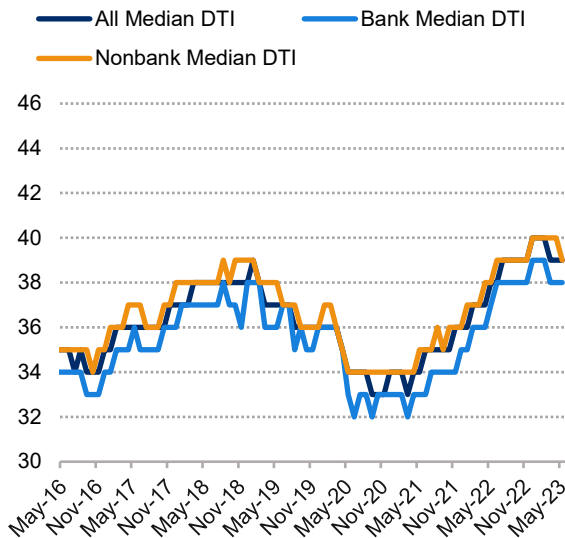
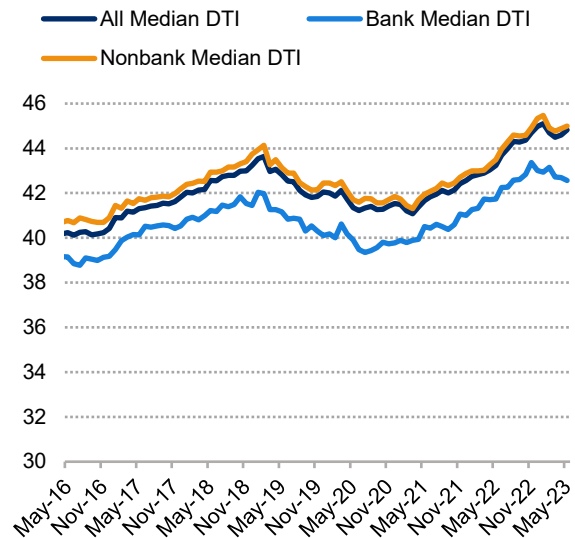


Figure 60. Ginnie Mae DTI: Bank vs. Nonbank



Sources: Recursion. Notes: Data as of May 2023.

As of month-end May 2023, the median FICO score for Ginnie Mae bank increased 10 points to 684 and nonbank increased 1 point to 674 MoM. The median FICO for all Ginnie originations increased 2 points to 675 MoM. The gap between banks and nonbanks is most apparent in VA lending (23-point spread).

Figure 61. Ginnie Mae FICO Score:

Bank vs. Nonbank

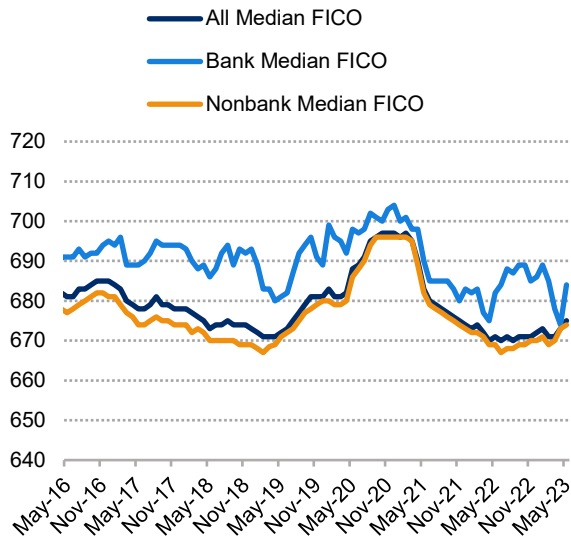


Figure 62. Ginnie Mae FHA FICO Score:

Bank vs. Nonbank

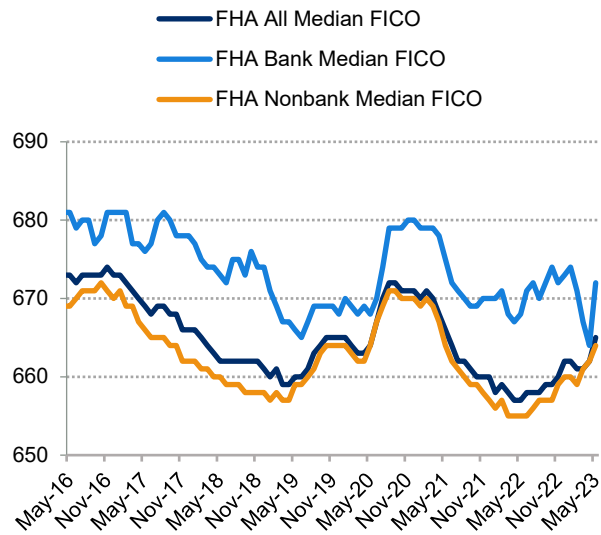


Figure 63. Ginnie Mae VA FICO Score:

Bank vs. Nonbank

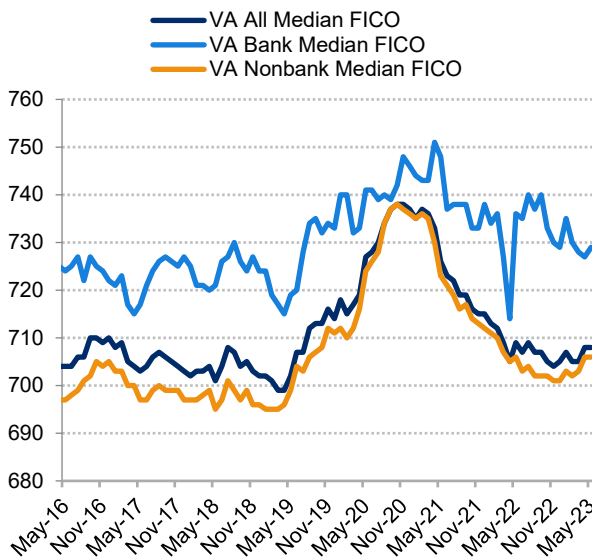
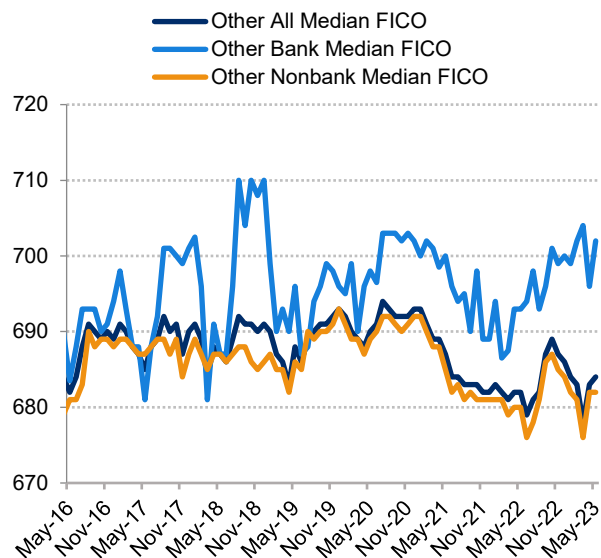


Figure 64. Ginnie Mae Other FICO Score:

Bank vs. Nonbank



Sources: Recursion. Notes: Data as of May 2023.

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 65. Ginnie Mae DTI:

Bank vs. Nonbank

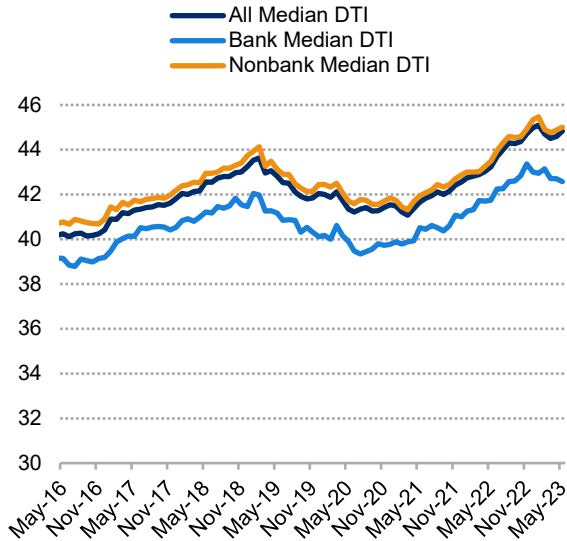


Figure 66. Ginnie Mae FHA DTI:

Bank vs. Nonbank

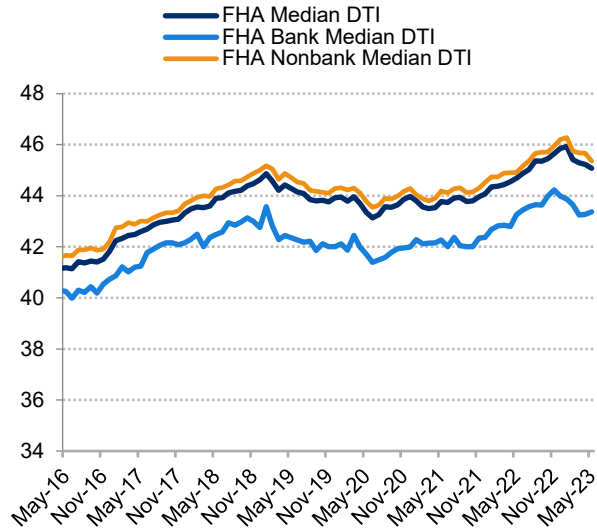


Figure 67. Ginnie Mae VA DTI:

Bank vs. Nonbank

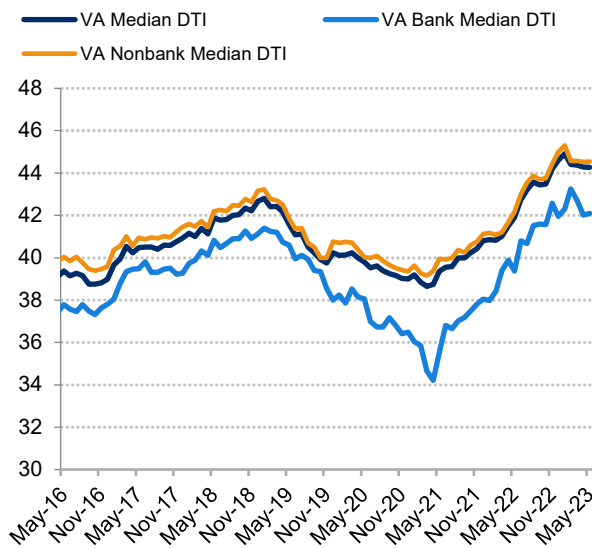
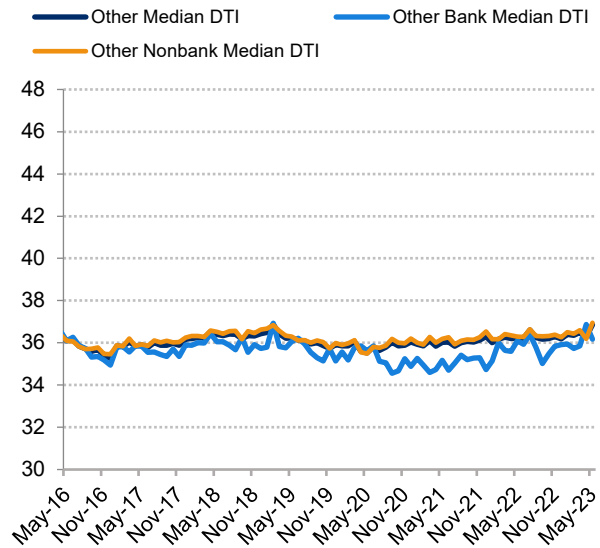


Figure 68. Ginnie Mae Other DTI:

Bank vs. Nonbank



Sources: Recursion. Notes: Data as of May 2023.

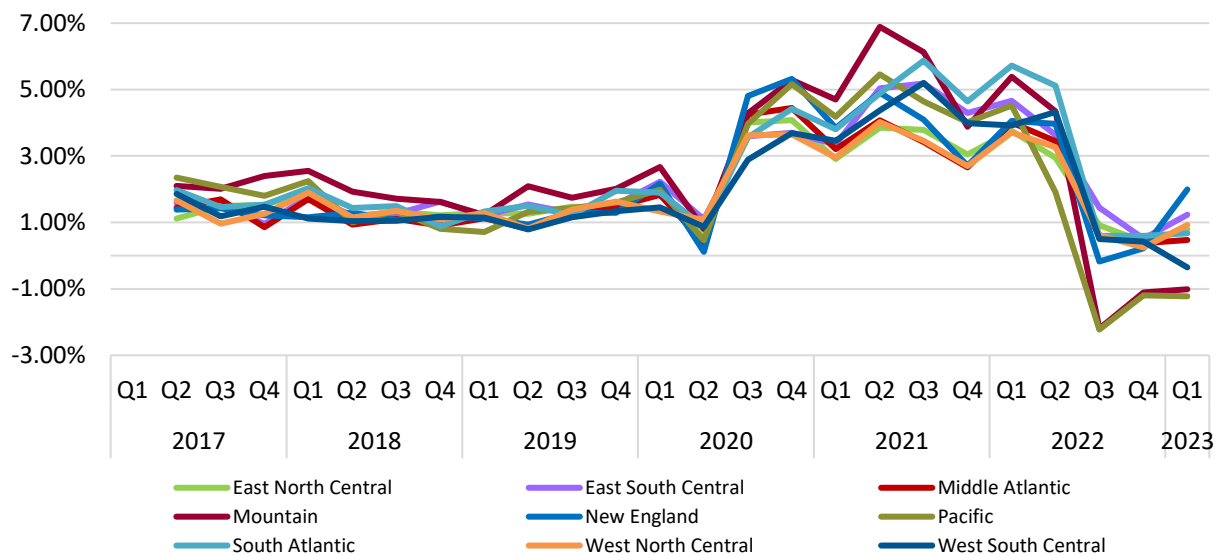
U.S. HOUSING MARKET

14 HOUSING AFFORDABILITY

14.1 Housing Affordability – Home Price Appreciation

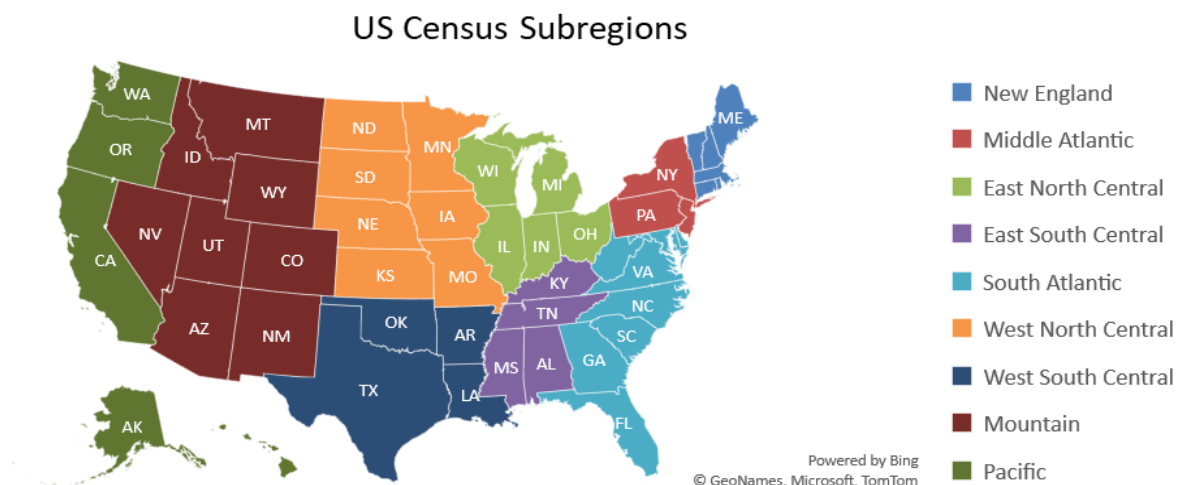
Home prices increased in all regions but the Pacific, Mountain, and West South Central in Q1 2023. Notably, the New England region experienced a 177 basis point QoQ increase in HPI between 2022 Q4 to 2023 Q1. The East South Central and West North Central regions saw a 72 and 68 basis point increase in the QoQ change in HPI, respectively.

Figure 69. Regional HPI Trend Analysis Q/Q



Source: HPI data from FHFA. US Census Subregions as defined by the US Census Bureau.

Figure 70. 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.

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

As of month-end May 2023, inflation was 4.1%, in line with the month prior. Nationally, rents are down -0.57% YoY as of month-end May 2023. However, the MoM change from April 2023 to May 2023 increased by 1.44%. Wage growth saw a decrease from 6.1% in April 2023 to 6.0% as of month-end May 2023. Month-end May 2023 reporting data shows YoY home price appreciation has slowed to 0.8%, down from 2.0% in February 2023.

Figure 71. Inflation | 12-Month Percent Change in CPI

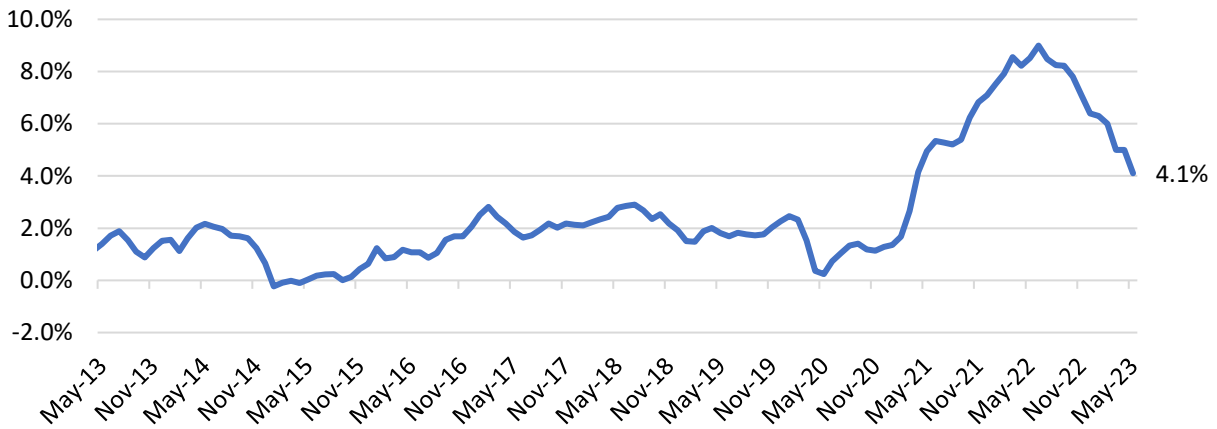
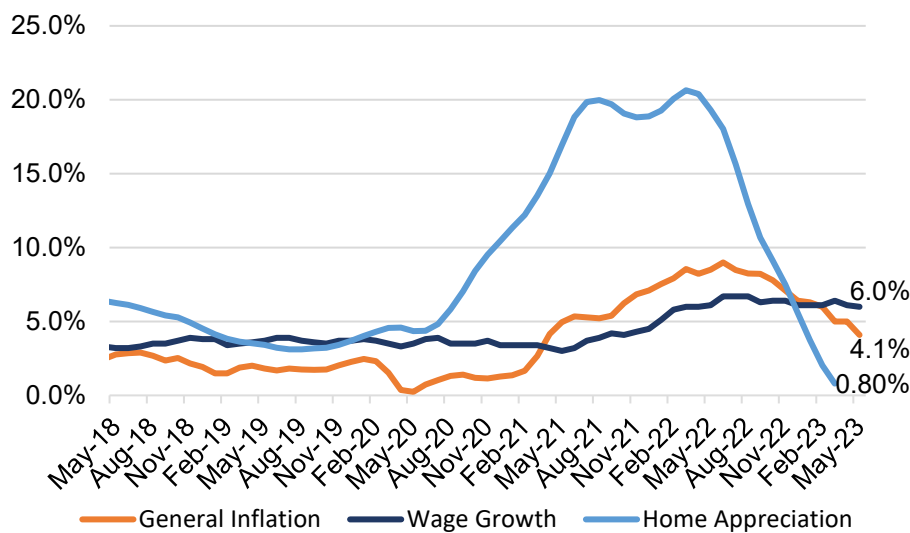


Figure 72. Asset Price Appreciation vs. Wage Increases

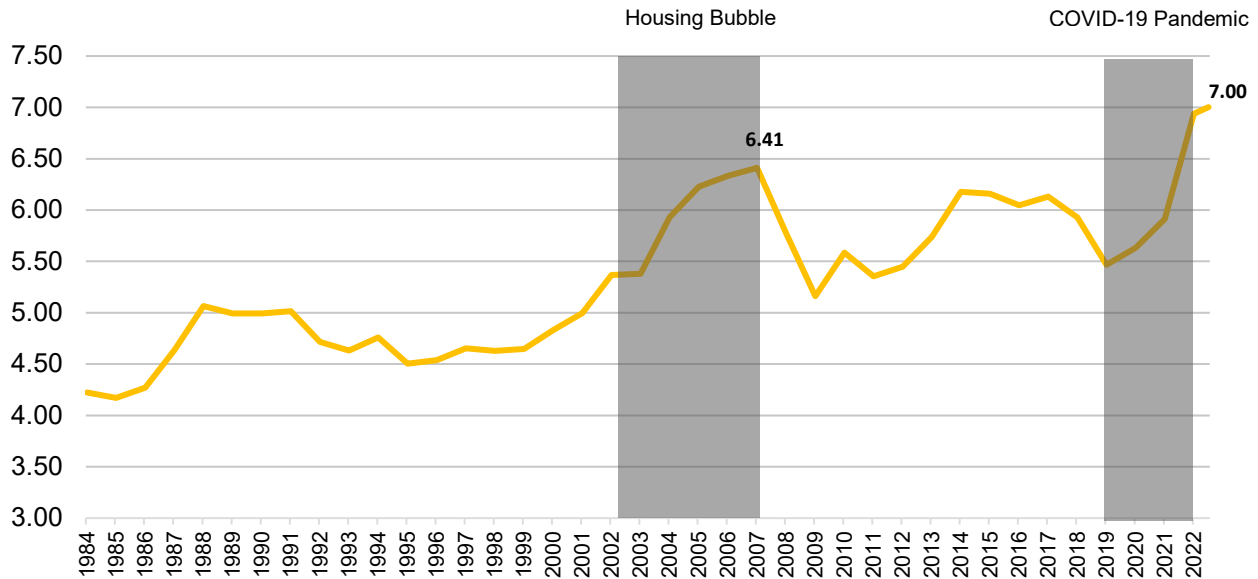


Metric	Statistic
General Inflation	4.1%
Home Price Appreciation (YoY)	0.8%
Rental Price Appreciation (Median Rent Change YoY)	-0.57%
Wage Growth	6.0%

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.

Home affordability remains low, as the ratio of the average price of sold homes to median incomes is at a historically high level. Typically, this ratio has been around 5:1; the current 7:1 sales price to median income ratio exceeds the ratio observed during the housing bubble (6.4:1). With declining home price appreciation, and home prices even dropping in some regions in the country, this ratio may drop back down to historically normal levels.

Figure 73. Average Price of Homes Sold to Median Income Ratio

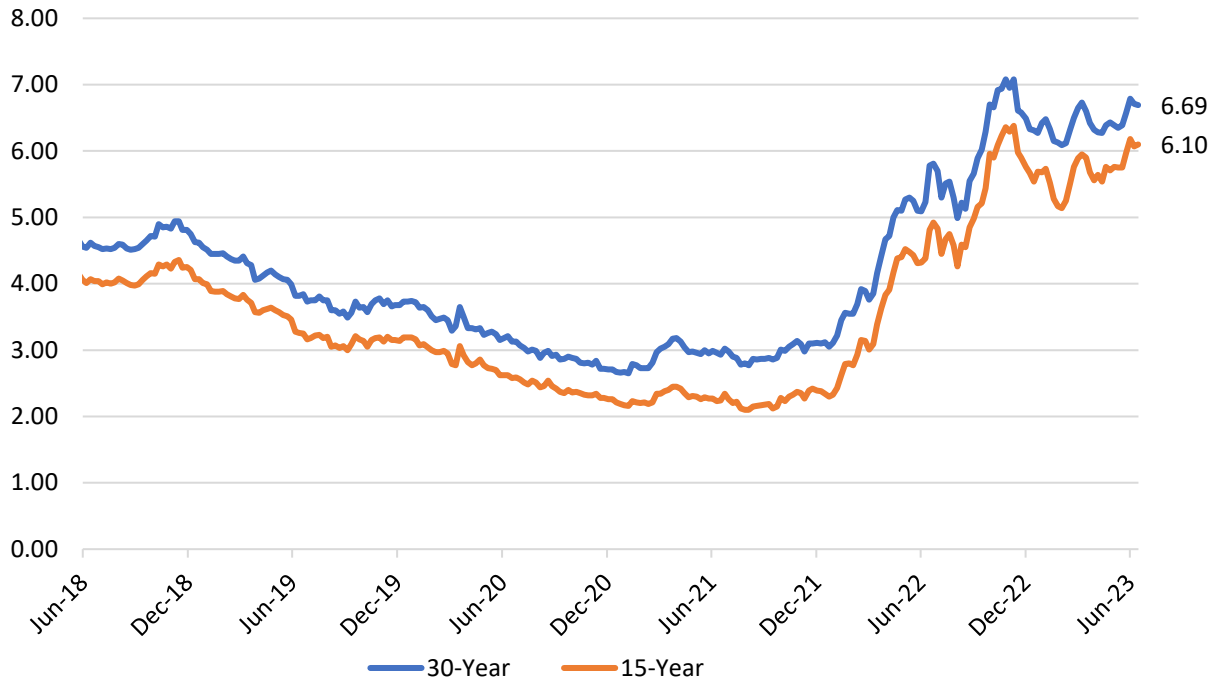


Source: FRED Average Home Sales Data, FRED Median Income Data

14.2.1 HOUSING AFFORDABILITY – MORTGAGE RATE TRENDS

The Federal Funds Target Rate stayed the same on June 14, 2023, at a range of 5.00% and 5.25% per the FOMC.⁶ As of June 15, 2023, the average 30-year and 15-year fixed rate mortgage rates were 6.69% and 6.10%, respectively. The average 30-year fixed rate mortgage rate increased 34 bps and the average 15-year fixed rate mortgage rate increased 35 bps MoM from May 11, 2023.

Figure 74. Average Fixed Rate Mortgage Rates



Sources: FRED data as of June 2023

⁶<https://www.federalreserve.gov/newsevents/pressreleases/monetary20230614a.htm>

14.3 Housing Inventory

As of April 2023, there was 7.6 months of housing inventory on the market, a decrease from 7.9 months in March 2023. 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 76**, increased in 2022; number of starts increased by 15.0% and numbers of permits increased by 10.7% while number of completions remained relatively stable.

Figure 75. Single-Family Housing Inventory

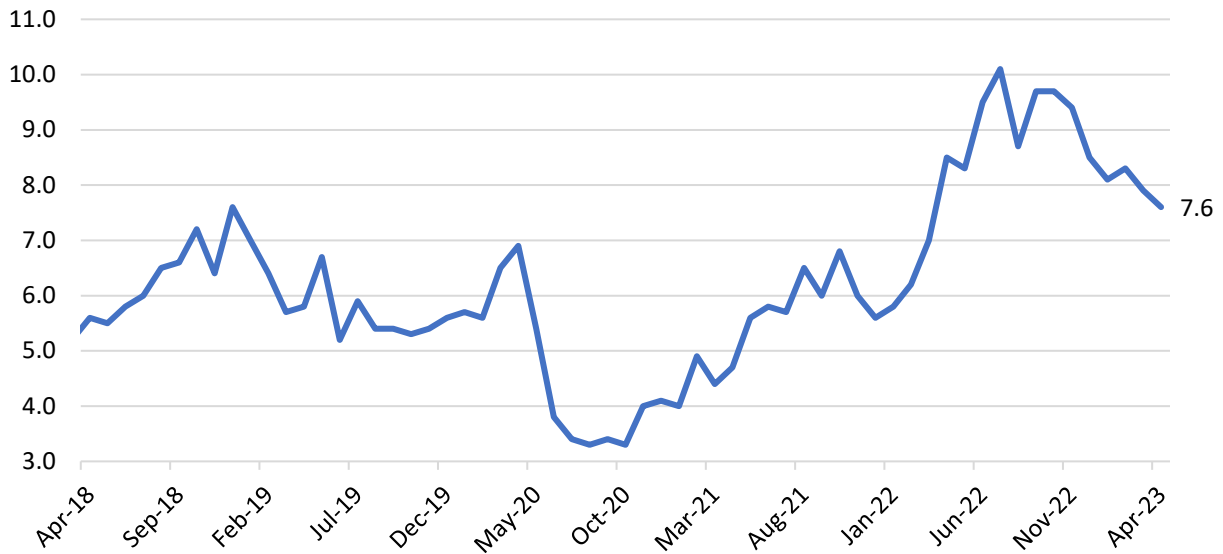
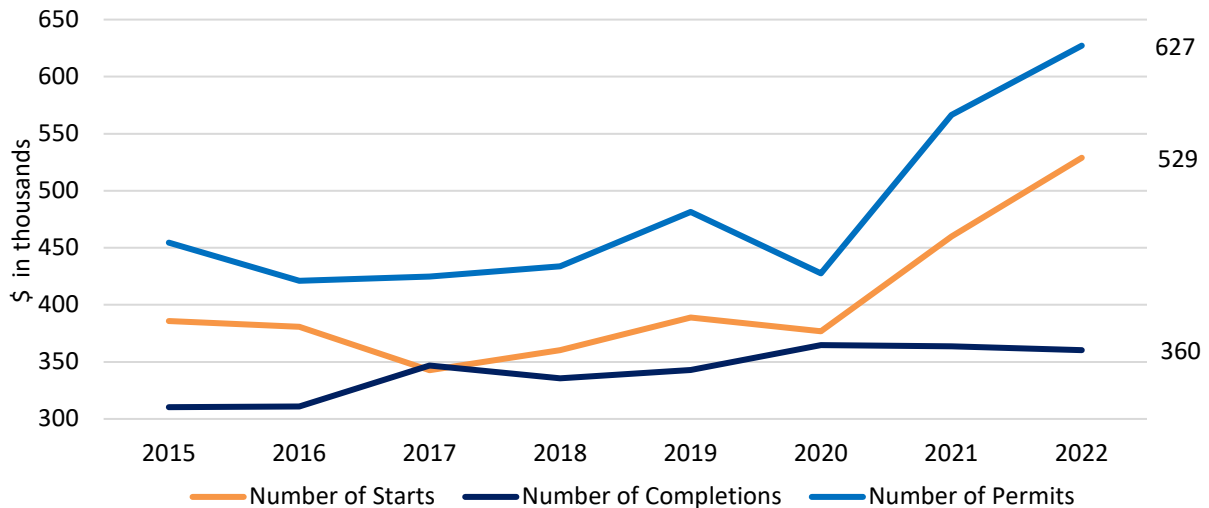


Figure 76. Multifamily Construction Metrics: Permits, Starts, Completions



Source: FRED. Figure 75: data as of April 2023. New Residential Construction, US Census Bureau. Figure 76: data as of December 2022.

14.4 Size and Value of the US Housing Market

The total value of the single-family housing market declined to \$41.2 trillion in Q1 2023. However, the total value of the US housing market is up 117% from its trough in 2011. From Q1 2022 to Q1 2023 mortgage debt outstanding increased from \$12.0 trillion to \$12.5 trillion and household equity increased from \$27.8 trillion to \$28.7 trillion. At \$8.9 trillion in Q1 2023, agency single family MBS continues to account for a growing percentage of the total mortgage debt outstanding, up to 66% of total mortgage debt from just 52% in 2011.

Figure 77. Value of the US Housing Market

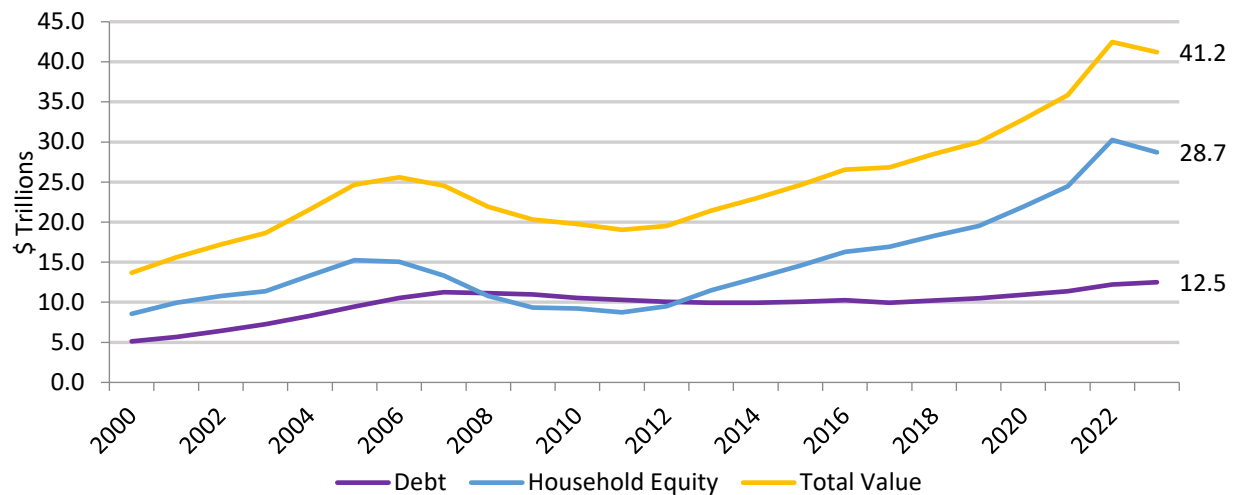
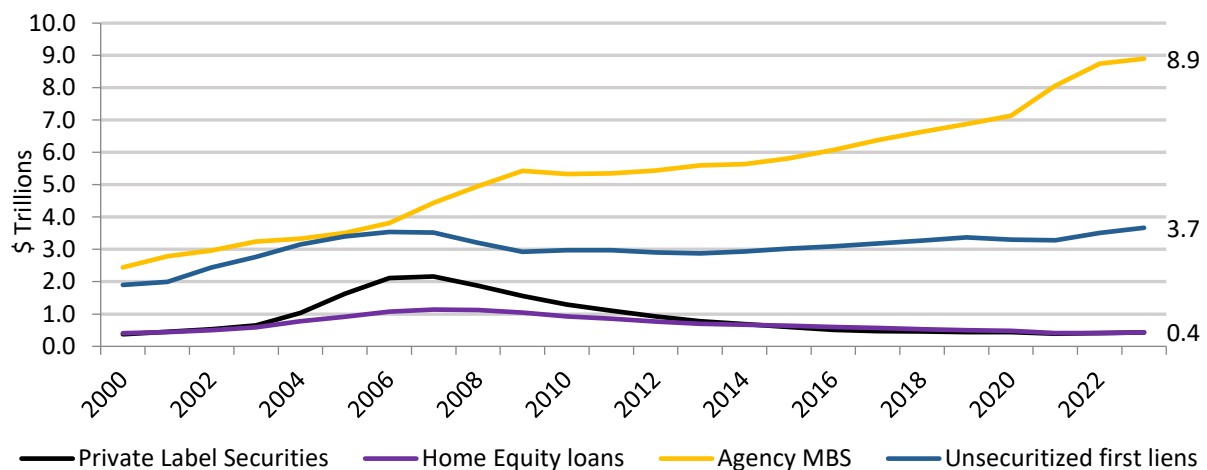


Figure 78. Size of the US Residential Mortgage Market.



Source: Federal Reserve Flow of Funds Data as of Q1 2023.

15 DISCLOSURE

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

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

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

The forward-looking statements, and underlying assumptions, speak only as of the date of May 31, 2023. Ginnie Mae expressly disclaims any obligation or undertaking to update or revise any forward-looking statement or underlying assumption contained in the report to reflect any change in its expectations or any change in circumstances upon which such statement is based.

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